

FLIGHT

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AND AIRSHIPS

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- Aug. 11-28. International Touring Competition, Berlin.
Aug. 19-21. 4th Annual Canadian Air Pageant, St. Hubert, Quebec.
Aug. 22-27. Plymouth Air Week.
Aug. 25. Folkestone Aero Trophy Race.
Aug. 28. Close of International Touring Competition, Berlin.
Sept. 3. Manchester-Liverpool Inter-City Race.
Sept. 3. Leicester Chamber of Commerce Day, at Desford.
Sept. 4. Divine Service at Ratcliffe Aerodrome, 2.30 p.m.
Sept. 5. F.A.I. Conference at The Hague.
Sept. 8. International Meeting, Vicenza, Italy.
Sept. 17. S. African Air Rally, Rand Aerodrome, Germiston.
Sept. 24. Hillmans' Air Display at Maylands Aerodrome, Brentwood.
Sept. 24. No. 45 Sqdn. R.A.F. Reunion Dinner, at Overseas League Club House, Park Place, S.W.1.
Sept. 25. Gordon Bennett Balloon Race, Basle.
Oct. 1. Bristol and Wessex Ae.C. Garden Party.
Oct. 18. Aero Golfing Society: Cellon Challenge Cup, West Hill G.C.
Nov. 18-Dec. 4. Paris Aero Show.

EDITORIAL COMMENT



OTTAWA is drawing to a close. So far the newspapers have made no mention of questions of Empire aviation having been discussed, although it is known that the subject was down on the agenda. Lt. Col. Shelmerdine, Director of Civil Aviation, is in Ottawa to represent the British Government, while Sir John D. Siddeley has gone over there as chairman of the Society of British Aircraft Constructors on behalf of the British aircraft industry. Among the larger issues it is to be sincerely hoped that the question of Empire aviation will not be lost sight of. When the subject does come up for consideration, Britain's two representatives may be relied upon to do everything possible to find a solution to any problems that may arise. The Director of Civil Aviation has had experience not only at home but also in India, while Sir John Siddeley's extensive interests in and control of important industrial firms fit him very particularly to act as the spokesman of the British aircraft industry.

The subject of Empire aviation has been before this country and the Dominions for a long time, and there is cause for hoping that real progress will be made at Ottawa. As long ago as the last Imperial Conference, held in London in 1930, the subject has been occupying the attention of the various Governments, but for a number of reasons the progress made has been rather slow. This is very seriously to be regretted, as the entire future of civil aviation may well be profoundly affected by the manner in which the British Empire attacks the problems.

Before discussions could be usefully commenced, the fundamental question of certificates of airworthiness had to be settled. We are glad to be able to state that, although but little has been heard of the fact, Great Britain and the various Dominions have gone a very long way towards agreement on this vital matter.

At the last Imperial Conference in London it was decided that an effort should be made to arrive at a uniform airworthiness system for the British Empire,

and work was taken in hand at once to bring together representatives of the Mother Country and the Dominions. The task was none too easy, partly on account of the great distances which separate the Dominions from London, and partly because operational conditions in many of the Dominions are so very different from those at home. However, largely due to the energy and enthusiasm of the late Air Commodore F. Vesey Holt, who was at that time Director of Technical Development at the Air Ministry, a committee was formed, and technical representatives from the Dominions were summoned to London, where work was commenced.

In the meantime, there had been flying accidents in which structural failure had occurred, and after most thorough investigations it was concluded that unusually violent air disturbances must have been the primary cause. Machines flying at fairly high speed and suddenly encountering rising and falling air currents of high velocity are subjected to stresses which may attain magnitudes which were not contemplated when the present system of load factors was drawn up. In this connection it is of interest to record that experiments made on an aircraft fitted with special instruments such as accelerometers, etc., indicated that even in the British Isles it is possible to meet ascending or descending air currents of high velocity. Accelerometer readings showed that stresses as high as 3g or even a little more could be induced in steady flight.

The Dominions, although, generally speaking, willing to accept the British system of airworthiness, might be more liable to troubles from gusts than we at home, and their representatives, not unnaturally, were a little doubtful concerning the entire adequacy of British load factors in certain cases. Canada in particular had been accustomed to having load factors as high as 8 or even 12 quoted by American firms, and although fully appreciating the very high quality of British workmanship, was inclined to press for an increase.

In the early part of this year, under the title the Civil Airworthiness Committee, a permanent committee was formed, composed of representatives of the Government (*i.e.*, the Air Ministry), the Society of British Aircraft Constructors, the insurance companies, and the operational concerns, such as Imperial Airways, the flying clubs, etc.

When the Ottawa conference was planned, and aviation included in the agenda, it became obvious that before the broader questions could be discussed there, that of an Empire system of airworthiness for civil aircraft would have to be settled, at least in principle.

By dint of extremely hard work on the part of everyone concerned, the numerous problems were attacked and promising solutions found. Although we would not claim that complete agreement has been reached on matters of minute detail, the broad outlines of an Imperial system of airworthiness regulations have been drafted.

Details of the new airworthiness system have not

been disclosed, but it is generally known in the aircraft industry that we shall have to make up our minds to agree to higher load factors. Although it seems almost inevitable that these will necessarily result in some increase in structure weight, it is not thought that such increase will be really serious, and we presume that allowances will be made in other respects, which will help to make up for any loss in useful load which the higher factors may incur. For example, under the present system of granting certificates of airworthiness, more than one machine has been well up to the stipulated load factors, but has fallen somewhat short in the matter of height attained in a given run. When it is remembered that many an aircraft is, once it has left the constructor's works and is quite beyond his control, habitually overloaded during its regular operation, it is almost impossible that anomalies should not exist, and the present take-off regulations may need modification.

Apart from a probable increase in load factors, it seems likely that a "gust" clause will be inserted in the new Imperial system of airworthiness regulations. The Dominions are almost certain to press for this, and in our own interests it may well be advisable to agree to it. What exact figure will be used we do not know, but it seems likely that gusts of 25 ft. per sec. may have to be catered for, and probably with a load factor of 2 or so on top of that. This would appear to be a minimum, judging from the experiments in which loads of 3g or more indicate gusts of even greater strength than 25 ft. per sec.

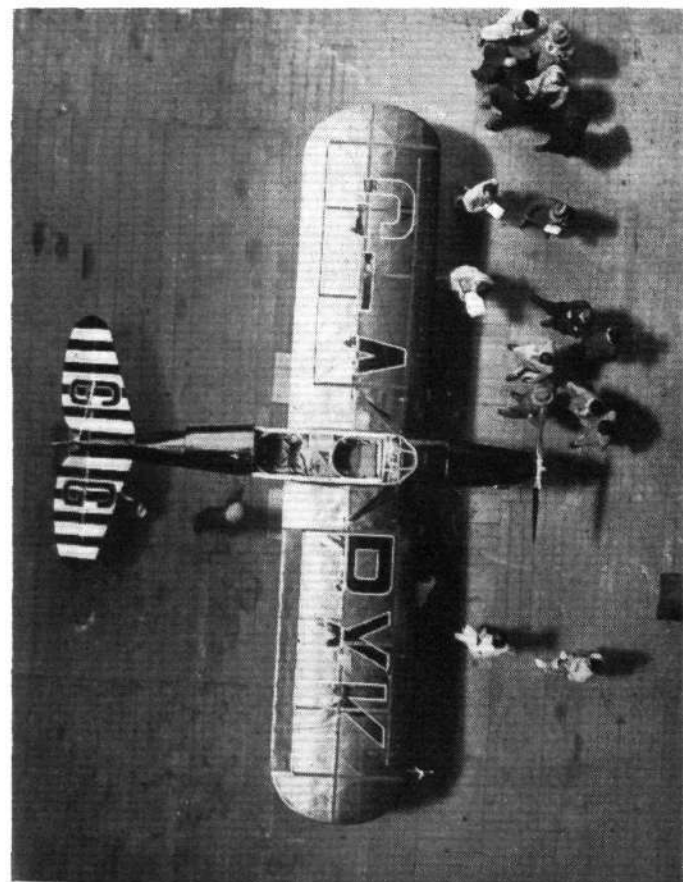
We have still some way to go before a new set of regulations can be made effective, but the subject is one of very great importance to the British aircraft industry, and although members of the S.B.A.C. and other interested bodies have, of course, full knowledge of the work that has been done, the discussions which have taken place and the arguments put forward, we have felt that the aviation-minded general public has known little or nothing of it. The effects of an Imperial system of airworthiness regulations may be very far-reaching, and to such firms as do not cater particularly for the Dominions it is possible that the new system may impose certain unwelcome handicaps. It may, of course, be that individual firms will have the option of retaining the present regulations should they so wish. In the great majority of cases, however, we believe that a uniform system of airworthiness will, even if there is an occasional grumble, be to the general benefit of the industry.

An increase in load factors looks at first sight like something of a hardship on the constructor, but, on the other hand, higher figures than ours have for years been quoted against British civil aircraft, and although one may treat them with a certain amount of mistrust as mere "paper figures," there is little doubt that they have had a certain effect. If, by a well-thought-out system of regulations, we can quote as high figures as the foreigner, the fact will not be without its value as a selling point.





SOME OF THE FOREIGN COMPETITORS: In the foreground the French machines, Guerschais, Potez, Farman and Caudron.



WEIGHED AND NOT FOUND WANTING: A Plan View of Miss Spooner's Breda 33 ("Gipsy III" engine). Miss Spooner herself may (or may not) be recognised near the starboard wing.

INTERNATIONAL TOURING COMPETITION

OUT of a total of 67 aircraft entered, 43 were ready at the Staaken aerodrome, Berlin, to commence the technical tests which precede the Circuit of Europe in the International Touring Competition for light aeroplanes. Germany having won this competition last year, the German Aero Club is organising this year's contest, and the technical tests, and start and finish of the Circuit of Europe, take place in Berlin.

A number of nations are represented in the International Touring Competition, the following countries and the number of machines representing them being as follows:—Germany, 16; France, 8; Italy, 8; Poland, 5; Czechoslovakia, 4; and Switzerland, 2.

Great Britain is not officially represented, as the maximum weight permitted by this year's regulations is below that of British light planes. There are, however, two unofficial British representatives in the competition, "Mr. John Carberry" and Miss Winifred Spooner. Mr. Carberry is flying a Klemm monoplane with de Havilland "Gipsy III" engine, and Miss Spooner is piloting a Breda 33, also with "Gipsy III" engine. But Mr. Carberry figures in the competition as a German competitor, and Miss Spooner has become, for the purpose of the tour, an Italian representative.

Germany is represented by 6 Heinkel He. 64 monoplanes (Argus and Hirth engines); 7 Klemm K1.32 (Gipsy III, Argus, Siemens and Hirth engines); 1 Darmstadt D.22 (Argus); 1 Monocoupe 110 (Warner Scarab); and 1 Raab-Katzenstein (Argus).



ACCESSIBILITY: The Klemm K1 32 ("Gipsy III") entered and flown by Mr. John Carberry.

France's representatives are: 2 Farman 234 (Salmson); 2 Potez 43 (Potez); 1 Caudron "Luciole" (Salmson); 1 Guerschais T.9 (Renault); 1 Mauboussin M.12 (Salmson); and 1 Farman 350 (Gipsy).

All the Italian machines are of the Breda 33 type, 7 being fitted with the Colombo S.63 engine and the eighth (Miss Spooner's) having a de Havilland "Gipsy III."

The Polish machines are of two types: the PZL 19 (Gipsy III), and the RWD 6 (Genet Major).

Of the four machines which represent Czechoslovakia 3 are Praga B.H. 111's (Gipsy III) (illustrated in FLIGHT last week), and 1 Breda 15 S. (Walter Junior).

Switzerland's representatives are 1 Klemm K1.32 (Gipsy III.) and 1 Comte AC 12-E (Gipsy III).

It is extremely gratifying to find so many British engines among the competitors. An even greater number figured in the full entries list, but many were not finished in time, or had troubles of various sort. For example, Pobjoy "R" engines were fitted in the Papenmeyer and Fieseler F.3 "Wespe" machines, but the aircraft did not turn up in time. The troubles were in no instance due to the Pobjoy engines.

The "Missing" Machines

The technical tests are being held at the present time, and as no useful purpose seems to be served by giving scattered and incomplete results, we do not propose to deal with these here, but to reserve them for an article in next week's issue. In the meantime it may be of interest to record quite briefly some of the reasons for the non-appearance of the machines which had originally been entered.

The three tailless machines entered by Fieseler (each with two Pobjoy "R" engines) were, apparently, of too experimental a character, and as two of them sustained damage during tests, Fieseler decided to withdraw all three entries.

The Japanese pilot, Hachisuka, who had entered a Gipsy-Moth, was informed beforehand that his machine was too heavy, and would not be admitted. He, apparently, did not believe this, but turned up with his machine. When it was weighed and found some 200 lb. too heavy, he is reported to have been very surprised.

The Messerschmitt machines were all withdrawn. Two rather serious accidents befell them during tests, the exact nature of which is not clear at the moment, but the designer decided to withdraw all the machines from the



GERMANY'S "WHITE HOPE": The new Heinkel He. 64 ("Argus" engine) is characterised by a very slim fuselage and a longer lever arm for the tail than is usually found in German machines.

competition. Up till then the Messerschmitt machines had been regarded as favourites in Germany. That place has now been taken by the new Heinkel machines. This, as previously pointed out in FLIGHT, is the first time Ernst Heinkel has entered the light plane field, and the performance of his machines is being watched with the very keenest interest. Fraulein Elly Beinhorn had entered one, and had been practising diligently for the take-off and



TWO FRENCH COMPETITORS: The Potez 43 machines are fitted with permanently-open slots.



HEADROOM: The Guerchais T.9 (Renault) flown by Henry Massot.

landing tests, and is reported to have become very adept at handling her machine. However, when the Messerschmitt machines were withdrawn, Fraulein Beinhorn very sportingly handed her Heinkel He.64 (Argus) over to Fritz Morzik, who was to have piloted one of them. Thus Morzik, who has twice won the International Touring Competition, will be well in the running again this year.

Another previous winner, Reinhold Poss, had been entered on a Messerschmitt, and, when that was withdrawn, Herr Siebel emulated Fraulein Beinhorn's example, and handed his Klemm K1.32 (Siemens) over to Pasewaldt, so that Poss could pilot Pasewaldt's machine, a Klemm K1.32 with Argus engine.

Raab nearly "missed the boat" on his Raab-Katzenstein 25-32 (Argus). When he was about to start from Adlershof, his engine refused to start, and by the time he reached Staaken it was one hour after the official "closing time." He still had the option of paying double entrance fee and get in that way. At first he refused to do this, but in the end he agreed (see p. 788).

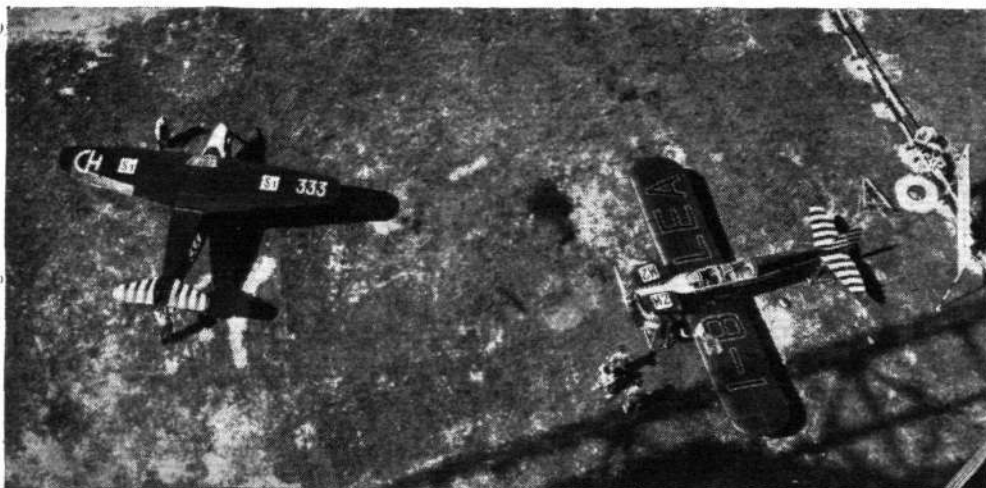
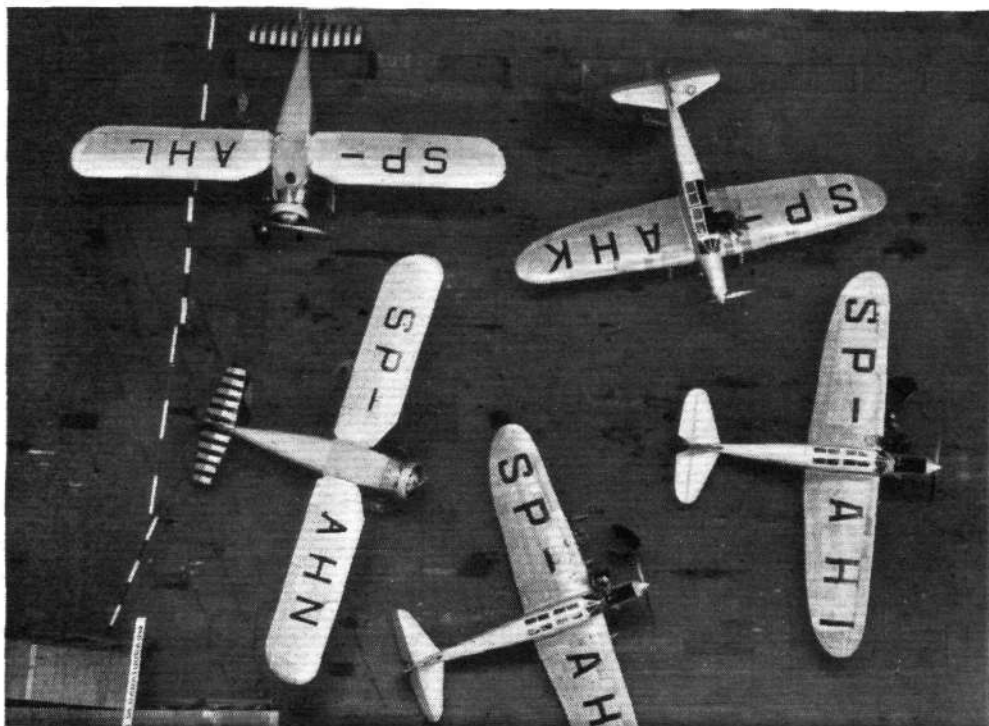
A belated arrival at double fee was also made by the Italian pilot, V. Suster, on a Breda 33, who brought the total number of machines ready to start their technical tests up to 43.

It is expected that the technical tests will be concluded by about midday of Saturday next, August 20, so that the competitors may have a little rest before they start on the Circuit of Europe. In the afternoon of that day the competitors will fly from Staaken, where the technical tests are being held, to Tempelhofer Field, whence the Circuit of Europe will start in the early morning of Sunday, August 21. The Circuit, a sketch map of which was published in FLIGHT

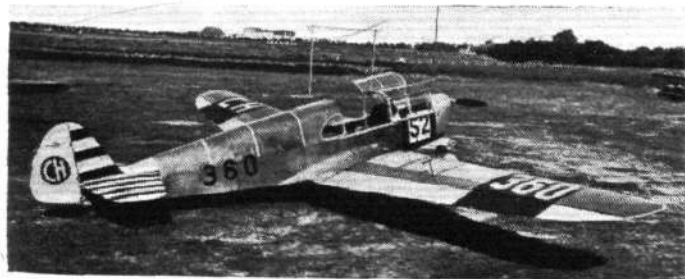
last week, will occupy the whole of the following week. For the benefit of any FLIGHT readers who might care to visit one of the Continental towns at which calls are made by the competing machines, we give the approximate time-table below.

The machines start from Berlin from the early morning of Sunday, August 21, and fly *via* Warsaw, Cracow, Prague, Brno, Vienna, Zagreb, Postumia, Vicenza, and Rimini to Rome, which will be reached during August 22.

Rome will be left on August 23, and the competitors will fly to Paris *via* Florence, Bellinzona, Turin, Albenga, Cannes, Lyons, St. Gallen, Stuttgart, and Bonn. Lyons is roughly the halfway point, and it may be expected that many of the competitors will spend the night of August 23 there, continuing the next morning to Paris, which will



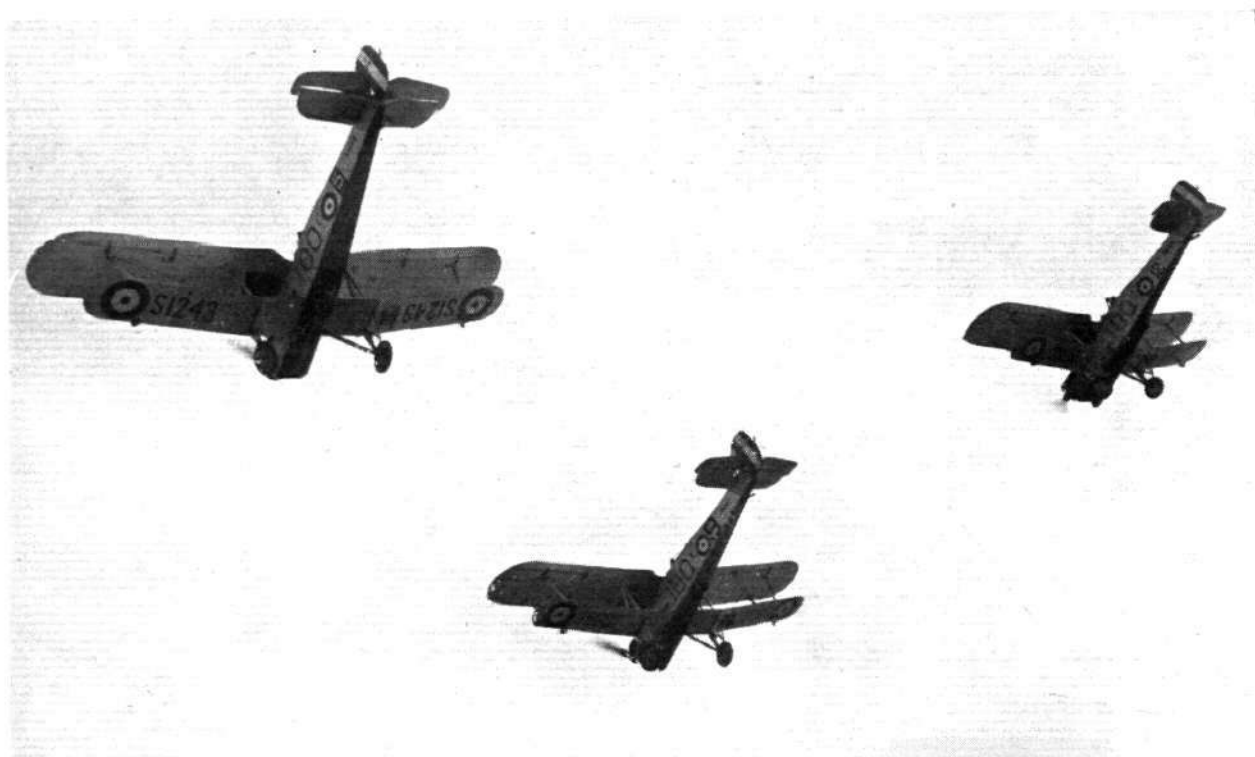
BEETLES AT BERLIN: Above, the Polish competitors, fitted with De Havilland "Gipsy III" and Armstrong Siddeley "Genet Major" engines. Below, on the left the Swiss Comte 12E ("Gipsy III") and on the right one of the Breda 33 (Colombo S.63) monoplanes.



be reached during the afternoon of August 24. Thursday, August 25, has been set aside as a day of rest in Paris.

On August 26 the machines will leave Paris for Berlin and will fly *via* Deauville, Rotterdam, Dortmund, Hamburg, Copenhagen, Gothenburg, Copenhagen and Hamburg. The nearest points to England will be Deauville and Rotterdam, where most of the machines will call during Friday, August 26.

A BRITISH-GERMAN-SWISS ALLIANCE: The K1.32 ("Gipsy III") flown by Fretz.



No. 100 (Bomber) Squadron

By MAJOR F. A. de V. ROBERTSON, V.D.

THE Air Force List is sometimes mildly misleading: If you hunt through its pages to find what squadrons are exercised in the use of the torpedo, you will find (in addition to seven flights of the Fleet Air Arm) only one squadron with the bracketed denomination of Torpedo-Bomber. That title is borne by No. 36 Squadron, which is stationed at Singapore. Its equipment is the "Horsley" (Condor). No. 100, the subject of the present article, is merely described as a Bomber Squadron. Yet it is, as a fact, a squadron which practises with the torpedo as well as with the bomb, and that is why it is stationed at Donibristle, in the county of Fife.

Fife, I believe, likes to be called a Kingdom, and Shakespeare has something to say about an official called Thane of Fife. Situated between two estuaries, with the Firth of Tay to the north and the Firth of Forth to the south, it is somewhat isolated from the rest of Scotland, and throughout history has lived a separate existence. The possession of St. Andrews, with its University and its Royal and



The top picture shows a flight of three Hawker "Horsleys" (Rolls-Royce "Condor") of No. 100 (Bomber) Squadron diving to the attack. The middle picture shows one of them dropping its torpedo at H.M.S. *Champion*, which appears in the bottom picture. (FLIGHT Photos.)



A Vickers "Vildebeest" (Bristol "Pegasus") with which No. 100 B.S. is to be re-equipped this summer. (FLIGHT Photo.)

Ancient Club, has brought it fame and has induced invasions from other counties and kingdoms. Still, from north and south it is not easy of access. The good burghers of Edinburgh spend much time gazing across the Forth at the hills of Fife, but to get from the capital across the water and arrive at a given time requires forethought. The famous Forth Bridge takes the trains across, but has no roadway. Trains are useful, but they do not always start just when you want them to. To go by road means driving up to Stirling, crossing the river there, and coming back along the northern bank. There is a ferry which will take cars across, but it, too, does not always start when you want it, and it is not cheap. In fact, to get from Edinburgh to Fife is a problem which is most easily solved by air transport; so if you have a friend at Turnhouse aerodrome who will fly you across, it is as well to accept his good offices. The trip is short, but, unless the Forth is much obscured by "haar," the view is fine, and it is fascinating to see the great Forth Bridge down below, looking like a twisted ribbon.

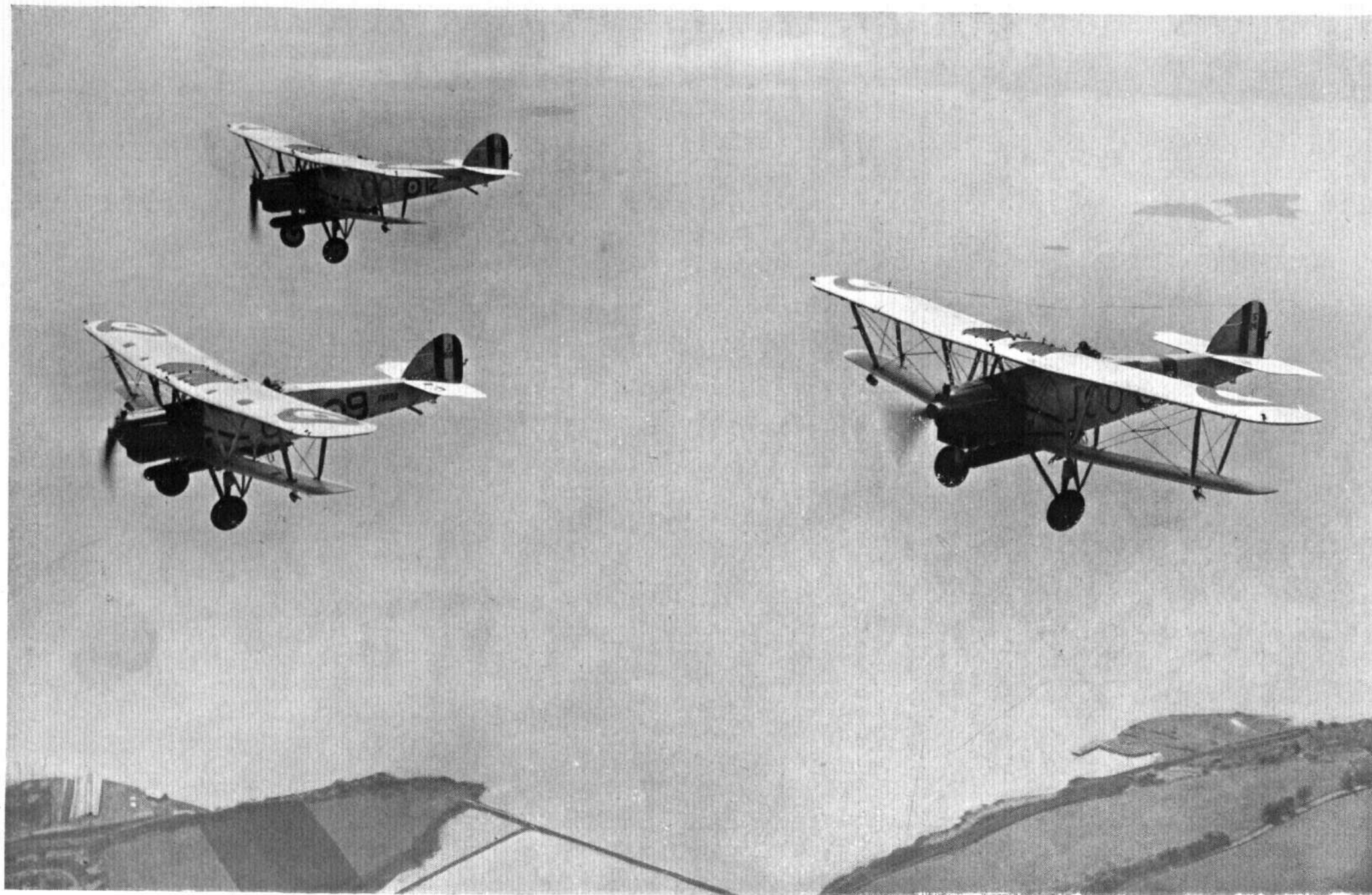
If you should land on Donibristle aerodrome, your pilot needs to keep his wits about him. It is a picturesquely situated aerodrome, and picturesqueness and happy landings do not accord too well together. The latter call for a bleak blank plain, with lots of room and nothing in particular to admire. The charming wooded hill in the neighbourhood of Donibristle makes for whimsical down currents of air, and the aerodrome itself is not of the largest. Moreover, what there is of it is cut up considerably by the tail-skids of the heavy "Horsleys." Moreover also, if the machine on which you have come over has wheel

brakes, let your pilot again be cautious. It is so tempting to put them on if the boundary hedge seems to be coming unpleasantly near, but if they make your wheels stick suddenly in a muddy, rutty surface, your propeller may find the ground quite as damaging as the hedge would have been. Used with due caution, however, brakes will be a present help in trouble.

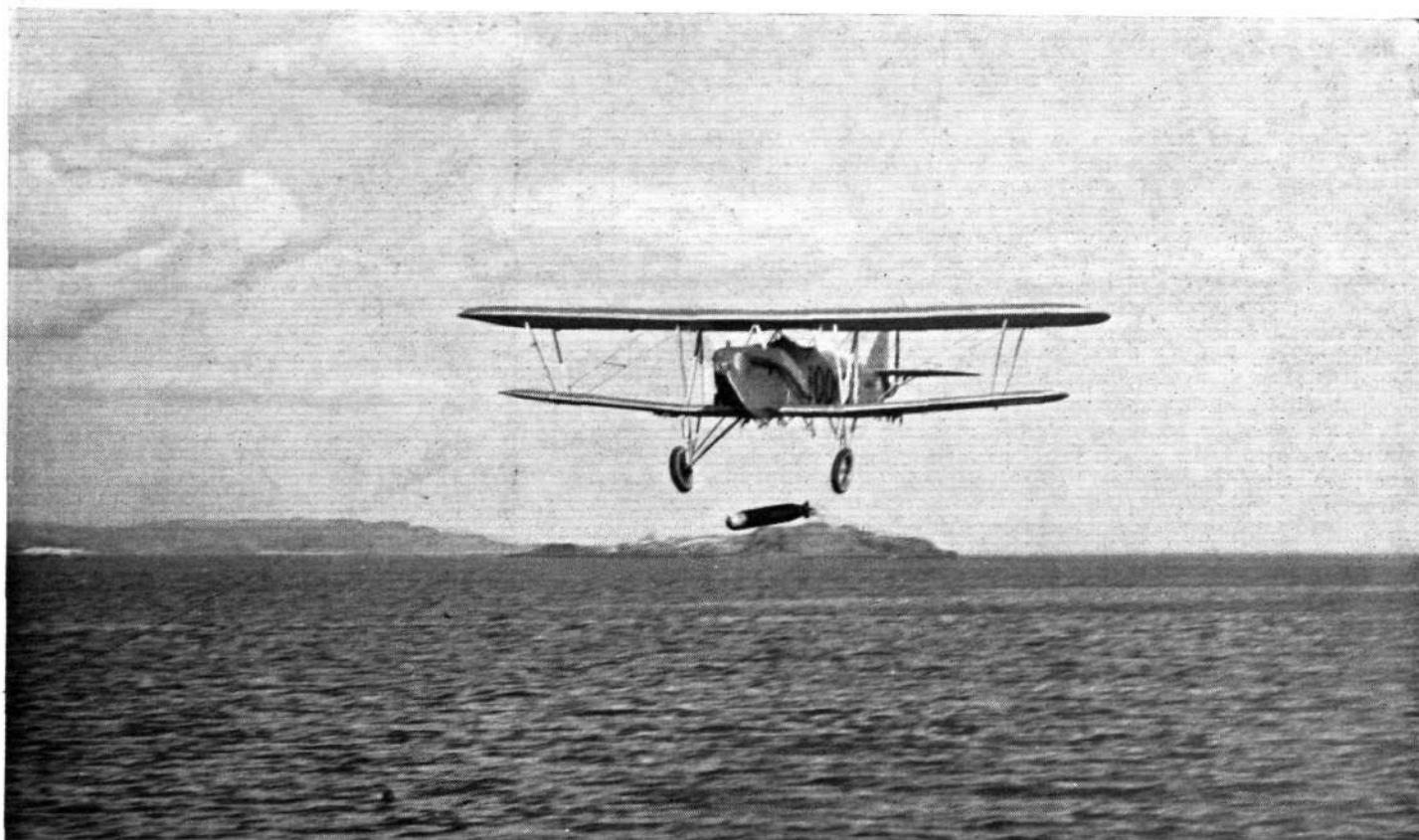
Apart from its somewhat limited area and its truly rural surroundings, Donibristle is an admirable site for a coast defence squadron. It is within easy reach of Rosyth, and warships are constantly going up and down the Forth. Naturally, most of them have to run the gauntlet of the dummy torpedoes of No. 100 B.S. That adds great interest to the life of the squadron, and it must be quite good fun for the Royal Navy, too. Take for example the little story told by our photographs. H.M.S. *Champion* is going down the Forth from Rosyth one morning on her lawful occasions. The naval authorities duly inform Wing Commander G. S. M. Insall, V.C., M.C., who commands the station of Donibristle, and he arranges with Sqd. Ldr. L. G. le B. Croke, the C.O. of No. 100 B.S., for a flight of "Horsleys" to go up and take tea with her as she goes. Up go the three great machines in formation, the "Condors," barking as birds of prey should do. From up above, the Forth makes a glorious sight with hills on both shores. To the south can be seen the castle rock of Edinburgh, once stormed by Robert Bruce's men and more recently bombed by a Zeppelin, and beyond it lies the small but quite imposing range of Pentland Hills. The Forth itself is dotted with picturesque rugged little islands, of which Inchkeith is the most important. To-day,



A GROUP OF OFFICERS AT DONIBRISTLE: L. to R.:—P/O. V. P. J. G. Doherty, P/O. G. L. C. Jenkins, Wing Cmdr. G. S. M. Insall, V.C., M.C. (Station Commander), Flt. Lt. R. Jones, Flt. Lt. G. V. T. Thomson, F/O. C. E. Morse, F/O. C. E. Spencer. (FLIGHT Photo.)



OVER THE FIRTH OF FORTH: Three Hawker "Horsleys" ("Condor") of No. 100 (Bomber) Squadron carrying torpedoes patrolling the approaches to Rosyth base. (FLIGHT Photo.)



DROPPING: A "Horsley" after diving down to 15 feet from the surface discharges a dummy torpedo. The island of Inchkeith is in the background. (R.A.F. Official: Crown copyright reserved.)

however, there is a bit of "haar" about, and the camera does not do full justice to a fine landscape and seascape.

The quarry is easily spotted down below, and the "Horsleys" prepare for action. One passenger gazes down on the cruiser with grim satisfaction, recalling that he had once been seasick on the *Champion* and chuckling that he was now getting some of his own back. For photographic purposes it looks well for the whole flight to commence its dive in formation, but actually the three "Horsleys" break formation before commencing to attack. The anti-aircraft guns on the cruiser must be distracted as much as possible by attacks from different directions. After circling round to choose his position, each pilot pushes his stick forward and commences a head-long dive. That is quite a great experience for the passenger, though not at all of the same nature as his recollections of the *Champion*. It is no time for photography, however. The roomy back cockpit of the "Horsley" is too much like the proverbial drum on which a pea once found itself. Down they come from some 4,500 feet to 15 feet in about seven seconds—seven seconds full of glorious life. At 15 feet the machines flatten out, and for a brief, dangerous period the pilots hold them steady on their course while they take aim. They must not be higher up, or the torpedoes will be broken by their fall into the water. Two machines are on one side of the ship and one on the other. The pilots work the levers so soon as they are satisfied with their aim, and the dummy torpedoes drop into the sea. Being real dummies, they do not run, and motor-boats from Donibristle dash out and pick them up. Theoretically H.M.S. *Champion* has been reduced to a lot of yawning holes connected with bits of metal, and is now lying at the bottom of the Firth. At the same time, no doubt, the A.A. gunners on board are gleefully telling all and sundry how they simply riddled the "Horsleys" with shells before ever a mouldy was dropped. Then both sides go off and have lunch.

Matters would not be so simple in the "real thing." It is, in fact, not very easy to picture what the real thing will be like, from the torpedo-plane point of view. It may turn out that these craft will be chiefly useful for attacks on fleets in harbour—if they can reach them; and on the other hand they may be able to cause serious embarrassment to fleets at sea. In all probability the torpedo attack will be combined with a bombing attack, the former taking place shortly before the latter. Both Nos. 36 and 100 Squadrons are equipped and trained as bombers as well as torpedo-dropping units. Perhaps one flight of the squadron would go over the ships first at a

great height and drop bombs. The bombs might do damage themselves, and in any case they would be likely to draw all eyes on the ships upwards. The muzzles of the guns would be likely to follow the eyes. That would be the moment for the torpedo-planes to deliver their attack. During their dive they might be in danger from anti-aircraft fire, if they were noticed, as it is not easy for a pilot to manœuvre his machine to the left or right during the dive, and so they would present a fairly steady moving target. But the most dangerous moment would be after flattening out when the pilots have to fly straight at 15 feet above the water as they aim. Incidentally, it is not too easy to maintain a level 15 feet altitude. If there seems any danger of flying into the sea, the nose is sure to be raised by an instinctive movement. If this is overdone, the machine will rise too high to allow of the torpedo being dropped without risk of its breaking up. But supposing the level height is maintained, this is the time when the machine presents the best target to the quick-firing guns. The moment the torpedo has been dropped, the pilot will naturally use all his wiles to escape.

It is sometimes suggested that smoke screens may be used to mask the approach of the torpedo-planes. Opinions seem to differ as to whether this would be good tactics or not. The smoke-layers might themselves suffer heavy casualties, the operation would certainly put all the gunners of the fleet on the *qui vive*, and then after all the wind might make the screen useless.

When attacking moving ships, the object of the torpedo-planes is to make a ship turn. Once it has commenced to turn, say the pilots, it cannot get back on to its course in a hurry, and then it should be cold meat. Therefore it is good tactics to make a preliminary attack with the object of causing a ship to turn, and when that has been effected the main attack should be delivered. There are, in fact, so many considerations that it would be premature to say that torpedoes from the air are considered a proved means of making a deadly attack on hostile ships. For that reason, perhaps, there is only one squadron in Great Britain and one overseas which has been given the task of experimenting with torpedoes, and it may also account for the omission of all mention of the torpedo from the description of No. 100 Squadron in the Air Force List. The Fleet Air Arm employs seven flights of torpedo-bombers, and therefore may be held committed to the policy of using torpedoes from the air; but the circumstances of flights on a carrier and squadrons at a shore base are not identical.

During this summer No. 100 B.S. is due to surrender its

These six pictures from a cinematograph film show stages in the discharge of a torpedo. (R.A.F. Official: Crown copyright reserved.)

"Horsleys" and receive in exchange the Vickers "Vildebeest" with Bristol "Pegasus" engine. The new machine will have a much better performance, and will be an improvement in every way. Pilots who have been flying "Horsleys" for some time get very fond of that machine, which is really a very fine aeroplane, and are sorry when they have to give it up. The change-over to an air-cooled engine is a very radical change, too, and the pilots will have to get accustomed to the absence of a long stretch of something in front of them. Pilots, however, are adaptable people.

Donibristle, despite the shortcomings of the actual landing ground, is an ideal situation for this squadron, as it offers every facility for training pilots in bombing and torpedo work. The squadron has made its own ranges for bombing practice in Largo Bay and Kircauldry Bay. In the vicinity is Haystack Island, which is kept white by the birds all the year round and makes a fine landmark. It would also be a good target for bombing practice.

A light railway runs from the torpedo workshops on the aerodrome to the bay, where the Marine Section lives, and so it is a simple matter to bring the retrieved torpedoes back from the shore. The Marine Section consists of one trawler, one speedboat, one new twin-engined speedboat, and two or three motor-boats. The trawler acts as safety ship and can recover discharged torpedoes. The speedboats can also collect torpedoes (and, if necessary, pilots), and also pull the tow-target. This consists of a length of cable representing a ship, with splashes to mark the position of the bow and stern. The motor-boats are generally useful.

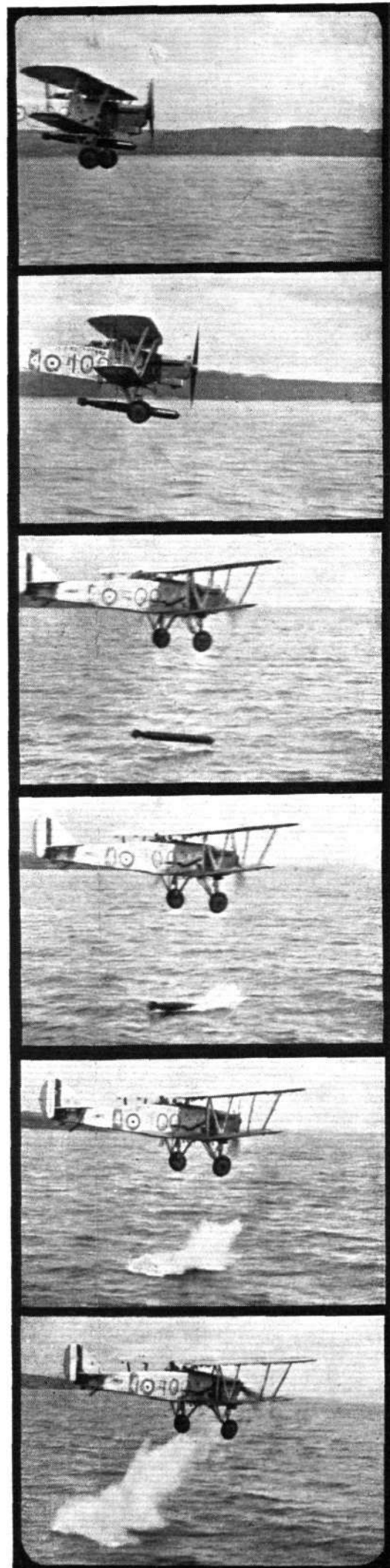
No. 100 Squadron had a fine war record as a night-bombing squadron. Its annals have been compiled by one of its late commanding officers, Sqd. Ldr. C. G. Burge. A résumé of its doings will doubtless be of interest, but first it will be more convenient to outline its history since the war. In 1919 the squadron re-formed at Baldonnel, Co. Dublin, under the command of Major (afterwards Squadron Leader) F. Sowrey, who had won fame by shooting down the Zeppelin L.32 (Commander Peterson) over Billericay. In place of the Handley Page 0/400 machines, with which it had been equipped at the time of the Armistice, it received Bristol Fighters. In 1922 the squadron flew to Spittlegate (now known as Grantham), and was re-equipped with the D.H.9A. The squadron was then used as a training unit, and its chief work was to instruct officers who had been "axed" from the Army and Navy and who had been selected for short service commissions in the Royal Air Force. In 1924 the machines were again changed, and the squadron received "Fawns." It moved again, this time to Eastchurch. In the Hendon Display of 1925 No. 100 Squadron led the formation of four bomber squadrons which so greatly impressed all spectators. In 1928 it moved to Bicester, then a new aerodrome, and on November 3, 1930, it went to its present station of Donibristle and took up torpedo work.

The Squadron's War Record

No. 100 Squadron was the first complete night-flying squadron that was sent to the Western Front in the great war. It was also the first squadron in the Independent Air Force. It was formed at South Farnborough in February, 1917, out of the Home Defence Wing, and its first commanding officer was Maj. M. G. Christie—now Group Captain on the retired list, with the initials C.M.G., D.S.O., M.C., after his name. The machines were F.E.2B. and F.E.2E.'s. The squadron crossed to France at once, and on April 5-6 it made a night raid on Douai aerodrome. Baron Manfred von Richtofen was there at the time, and he has written a vivid account of this raid in his memoirs. In May, 1917, the squadron was stationed at Trezennes aerodrome, near Aire. While there it took part in the battles of Vimy Ridge, Arras, Messines, and the third battle of Ypres. This was strenuous work, and the squadron won a high reputation for its energy and general efficiency.

In October, 1917, the squadron was detached from the Army and became part of the Independent Air Force under General Trenchard. It moved to Ochey aerodrome, in the neighbourhood of Neufchateau. Maj. Christie was the first pilot to land on the area of the Independent Air Force. Ochey aerodrome had been constructed by the French, and they had to share it with a French squadron. It proved to be an easy target for the German bombers. No. 100 were considerably harrassed by them, but it was realised in time that a move was necessary. So, before any great loss had been sustained, the squadron made a camp in the wood, and derived some satisfaction from watching the enemy bomb the deserted hangars.

In December, 1917, Maj. Christie gave over command of the squadron to Maj. W. J. Tempest, D.S.O., M.C. Like Maj. Sowrey, who took over the command in 1919, Maj. Tempest came from No. 39 Home Defence Squadron, and was the destroyer of a Zeppelin. His exploit was particularly useful, because the airship which he shot down was the L.31, one of the very latest type of Zeppelin, and her commander was the famous Mathy, the most skilful and resolute of all the Zeppelin



commanders. The loss of Mathy was a blow from which the German naval airship service never recovered. The *L.31* fell in flames at Potter's Bar.

In March, 1918, when the last great German offensive started, No. 100 Squadron was moved for a while up to an aerodrome near Rheims, and was busily employed on every night when the weather was suitable in bombing the lines of communication of the advancing Germans. Then it returned to Ochey and the Independent Air Force. The work of that force was to bomb the factories in the Rhine towns, thus holding up the enemy's munitions, and also causing him to withdraw fighter squadrons from the front.

In June, Maj. Tempest gave over the command to Maj. C. Gordon Burge, who commanded the squadron until the Armistice, and afterwards compiled its history. He is now well known as the editor of the *Air Annual of the British Empire* and the *Royal Air Force Quarterly*.

By this time it was obvious to everyone that the brave old F.E. machines had outlived their usefulness, even as night bombers. They could not carry a heavy enough load of bombs, and they were slow at manoeuvring to dodge searchlights. In August the squadron was re-equipped with the Handley Page 0/400 with two Rolls-Royce "Eagle" engines. General Trenchard put it on record that this squadron "was one of the quickest squadrons I have ever had under my command at learning new type machines when it was re-equipped with Handley-Pages." The F.E. machines, however, sang a great swan song, for at the end of July and the beginning of August the squadron brought off a series of raids on 13 consecutive nights. This was its record; its previous best was raids on 11 consecutive nights.

In the course of its two years (less some months) in France, the squadron made 213 raids and dropped 185 tons of bombs. Thirty-five officers and airmen of the squadron received decorations. Twenty-eight officers and airmen lost their lives either in action or by accidents. Night-flying squadrons normally had fewer losses in action than the day squadrons had. Forced landings behind the enemy's lines were the fate most dreaded by the men who flew by night, but No. 100 Squadron was fortunate in losing only 39 officers and men as prisoners of war. Lord

Trenchard has called No. 100 "one of the 'great squadrons' of the war."

Note.—Since the above article was written Wing Com. Insall, V.C., has been transferred from Donibristle.

Royal Air Force Squadrons

Other descriptive articles concerning the work of various R.A.F. Squadrons, etc., have been published in *FLIGHT* as follows:—

- May 16, 1930. H.M. Aircraft Carrier *Glorious*.
- June 27, 1930. No. 4 (Army Co-operation), South Farnborough; No. 17 (Fighter), Upavon; and No. 33 (Bomber), Eastchurch.
- August 15, 1930. No. 601 (County of London) (Bomber) Sq., A.A.F. (at Lympne).
- September 19, 1930. No. 43 (Fighter) Sq. (Tangmere).
- December 19, 1930. No. 2 (Army Co-operation) Sq. (Manston).
- April 24, 1931. No. 101 (Bomber) Sq. (Andover).
- June 12, 1931. Nos. 204 and 209 (Flying-Boat) Sq. (Mount Batten).
- June 26, 1931. "1890-1912-1931." (A Brief Outline of the Growth of the Royal Air Force.)
- July 10, 1931. Cambridge University Air Sq. (at Old Sarum).
- July 17, 1931. Central Flying School (Wittering).
- August 7, 1931. Oxford University Air Sq. (at Eastchurch).
- August 21, 1931. No. 600 (City of London) (Bomber) Sq., A.A.F. (at Tangmere).
- April 1, 1932. No. 605 (County of Warwick) (Bomber) Sq. (at Castle Bromwich).
- May 13, 1932. No. 40 (Bomber) Sq. (Upper Heyford).
- June 10, 1932. Nos. 7 and 58 (Bomber) Sq. (Worthy Down).
- June 17, 1932. A visit to H.M.S. *Exeter* of 2nd Cruiser Squadron, Home Fleet.
- July 22, 1932. Oxford University Air Sq. (Eastchurch).
- August 5, 1932. Cambridge University Air Sq. (Netheravon).
- August 12, 1932. No. 1 Air Defence Group (Auxiliary Air Force and Cadre Sq.).



A REMARKABLE CRASH

ON July 29 the Lufthansa Junkers - Ju 52/3m. D.2201, when returning from Zurich after winning the Chavez-Bider Cup, was involved in a remarkable mid-air collision with a "Flamingo" light aeroplane in the neighbourhood of Munich. According to the report of Herr Milch—a Director of Lufthansa who was one of the passengers—they had just left the aerodrome near Munich en route for Berlin when, at about 300 m., suddenly a formidable crash occurred, which at first was thought to be an explosion. Large holes appeared in the left wall of the cabin, which also caved inwards, while sundry pieces of material—later found to be parts of a machine—flew into the cabin. The Junkers simultaneously made a sharp turn to the left and dropped about 50 m.

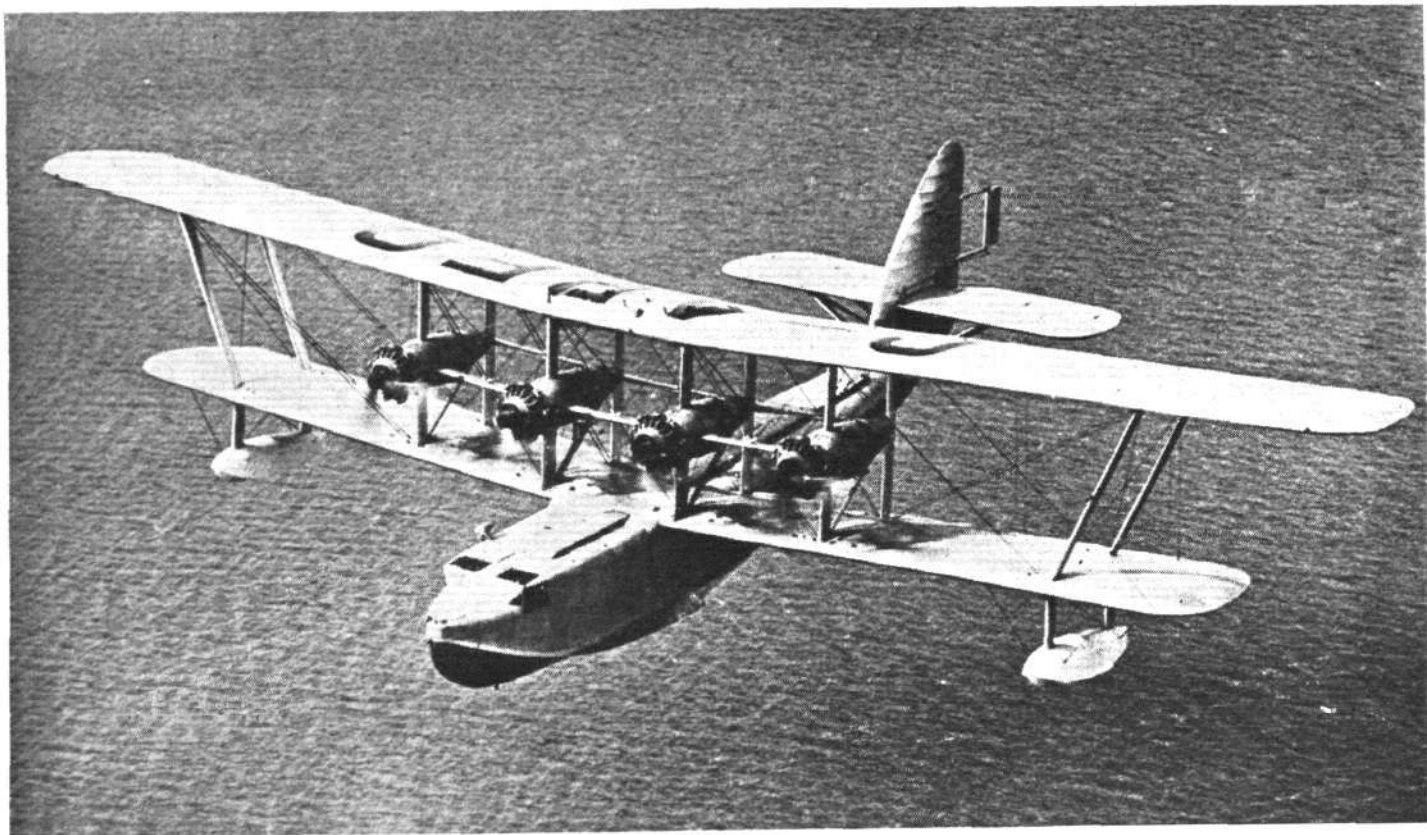
It was then noticed that the port engine was half torn out of the damaged left wing and was hanging down with the propeller broken. No one suspected that a collision had occurred, as the other machine had not been noticed, and only later was it ascertained that the "Flamingo" coming from below had flown, first against the Junker's left wheel and then into the engine and wing, finally crashing to the ground. Its pilot—a pupil named Kruse—made efforts to escape with his parachute, but failed and was killed.

However, the pilot of the Junkers, Flight-Capt. Polte, and his mechanic Haensgen, succeeded after a few seconds in getting the machine under control, and throttling down the remaining engines, got the machine into a glide. They



A REMARKABLE CRASH: The damage to a Junkers Ju 52/3 m. caused by a mid-air collision with a "Flamingo" light plane. The Junkers managed to land safely without injury to passengers or crew.

just managed to clear some high tension cables and land in a small field; the left wheel having been smashed in the collision, the Junkers naturally tipped over on the left wing and swung round some 100 deg. as it touched. Nevertheless, the fuselage with central engine and cabin, and the right wing were entirely undamaged, while the passengers and crew were quite uninjured. To come through such a collision as it did—with so little damage and no injury to the occupants—speaks well for the Junkers construction.



The Short "Kent" Class

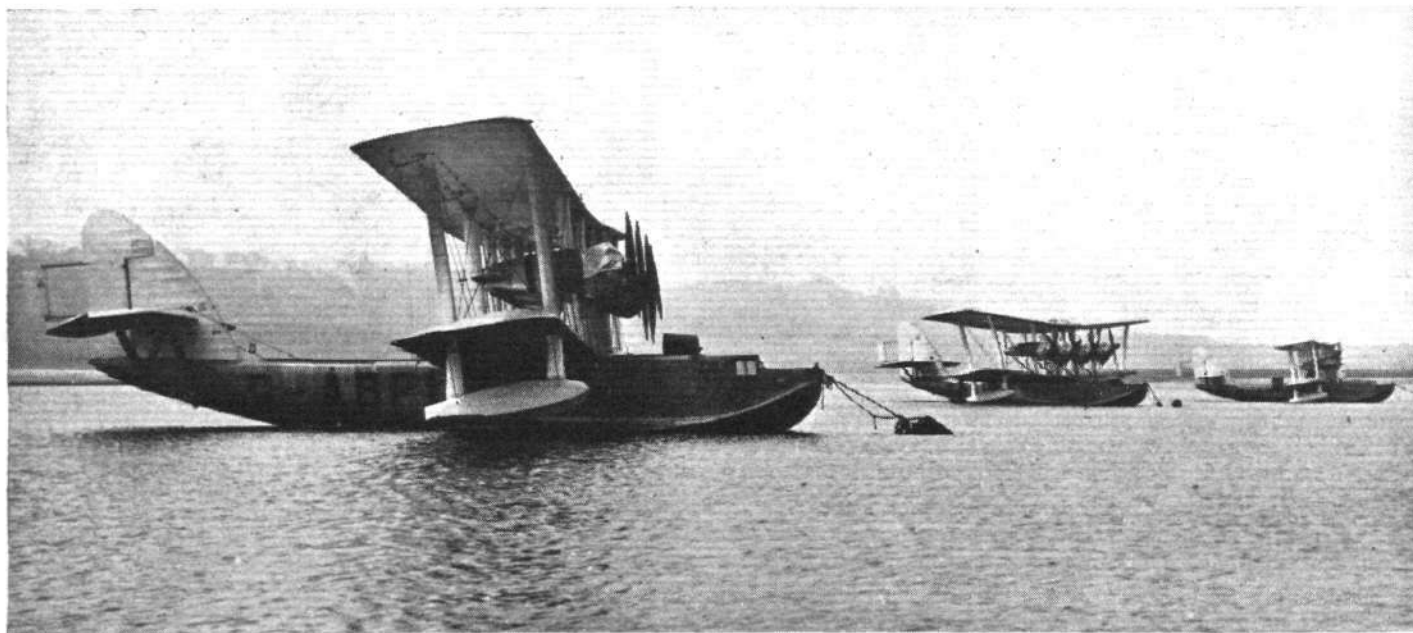
162,000 Miles Flown Without Trouble

THE great success of the Short "Calcutta" flying boats operated by Imperial Airways led one to expect great things from their successors of the "Kent" class, and the expectations have been fully realised. The "Calcuttas" have by now completed 308,000 miles on the Mediterranean and 186,000 miles on the northern section of the Cairo-Capetown air mail route, or the impressive total of 494,000 miles. In other words, only a little short of half a million miles!

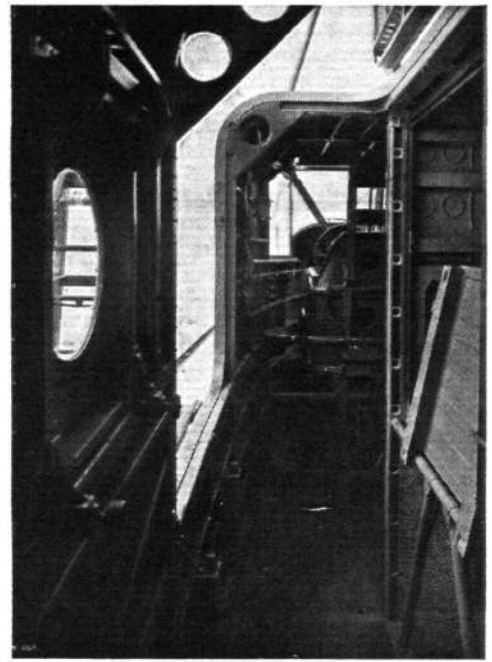
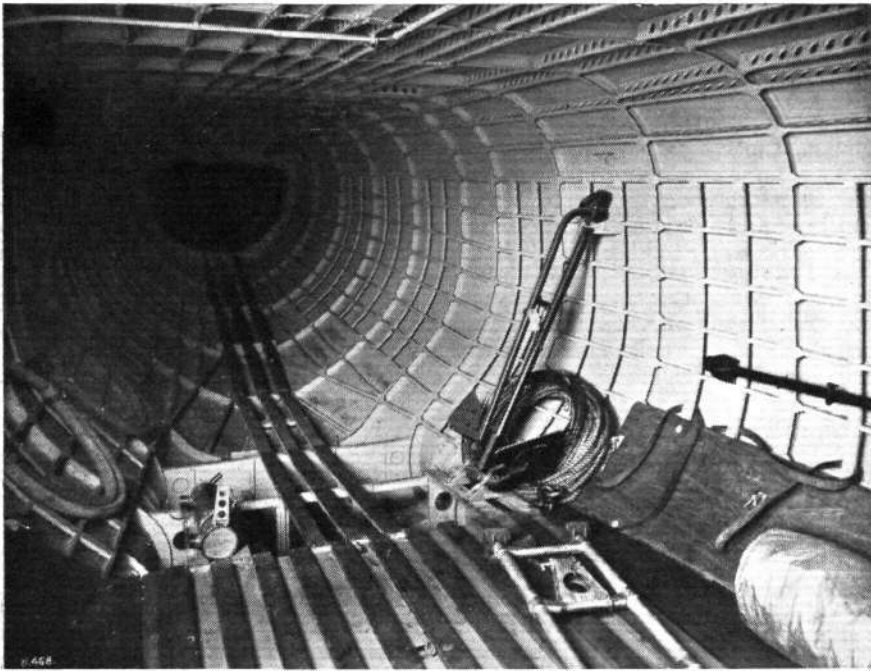
During this time the "Calcuttas" have been subjected to practically continuous open-air exposure, and have quite definitely proved the value of all-metal flying boat construction from the maintenance point of view.

The three flying boats of the "Kent" class, christened by Imperial Airways "Scipio," "Sylvanus" and "Satyrus," have now been in regular use on the Mediterranean section of the London-Cape air route, and have already established a mileage of 162,000 miles without trouble of any kind. When the first machine of the "Kent" class was first flown it was found to be absolutely "right" from the very start, and *not a single modification* of any importance was required. That is an achievement of which Short Brothers may well be proud, and which confirms the view long held that the Shorts are the finest commercial flying boats in the world.

In the "Kent" class a real endeavour was made to



"SCIPIO," "SYLVANUS" AND "SATYRUS": At Moorings in the Medway, off the works of Short Brothers.



SPACIOUSNESS: On the left a view inside the hull, looking towards the stern. Note the absence of obstructions. On the right, the passengers' hatchway, with corridor leading forward to pilots' cockpit and aft to passengers' cabin. Opposite the hatchway is the mail compartment.

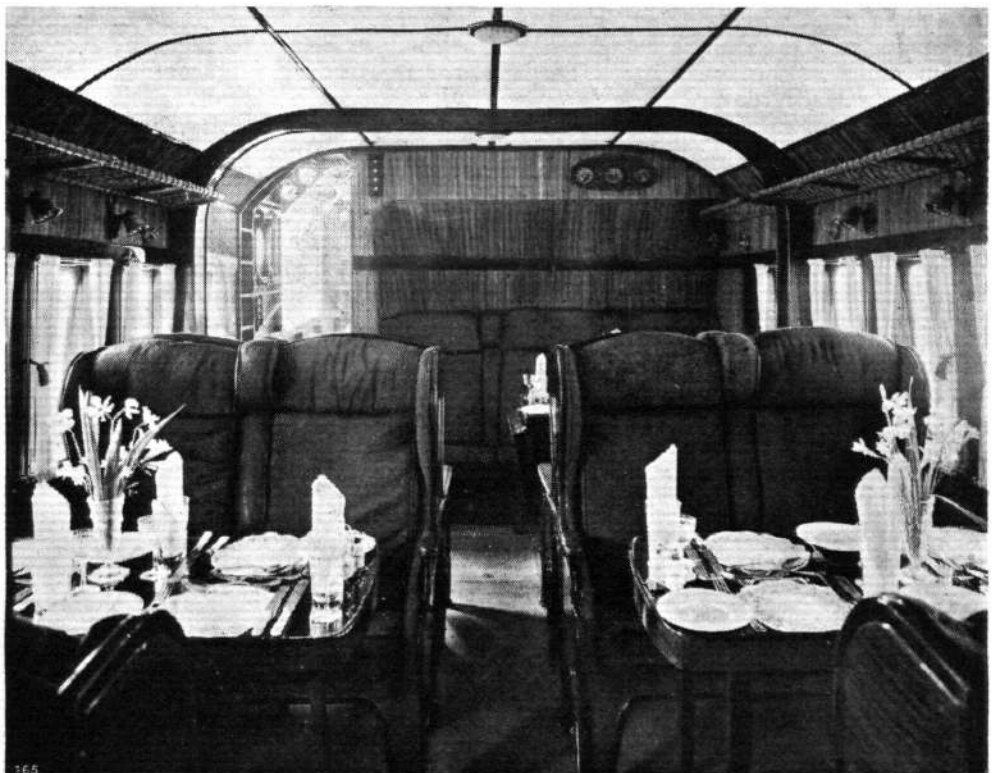
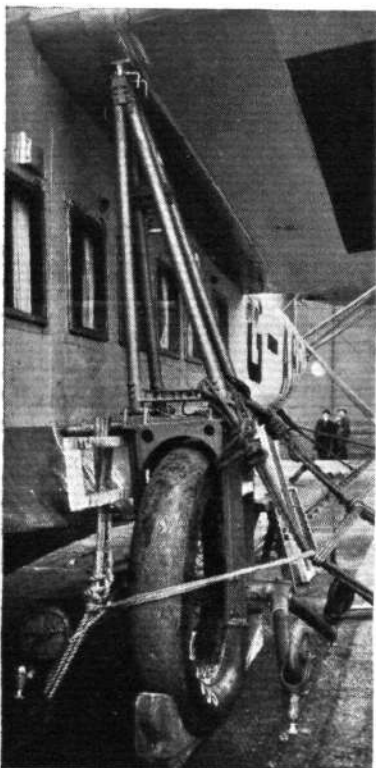
provide comfort for the passengers, and so successful has this been that people who have travelled in them aver that the noise is certainly no more, and perhaps even a little less, than that encountered in a railway train. Coupled with the absence of noise in the "Kent" boats is a cabin in which not only are very comfortable seats provided, but also, and this is less usual, there is plenty of leg and elbow room, as the photograph of the cabin will indicate. And furthermore, the passengers can get up and walk about, so that even on a long journey one experiences no fatigue and no signs of that cramped feeling which results from long flights in a confined space.

The Short "Kent" class of flying boats are fitted with four Bristol "Jupiter" X.F BM engines, developing a normal power of 555 b.h.p. each at 2,000 r.p.m. and 4,000 ft. altitude, and a maximum power of 600 b.h.p.

each at 2,200 r.p.m. and 5,000 ft. altitude. The gear reduction to the airscrew has a ratio of 2:1. Four of these engines are fitted in each machine.

With a wing span of 113 ft., an overall length of 78 ft. 5 in. and a wing area of 2,640 sq. ft., the "Kent" has a tare weight of 20,460 lb. fully equipped, while the permissible gross weight is 32,000 lb., giving a ratio of gross to tare weight of 1.563. For the Mediterranean route the machine is equipped to carry 15 passengers, a crew of three and 4,085 lb. of mails. The total pay load, exclusive of crew, is 7,460 lb.

The "Kent" has a maximum speed of 137 m.p.h. at 5,000 ft., a cruising speed of 105 m.p.h. at 5,000 ft. and a minimum flying speed of 60 m.p.h. The rate of climb at sea level is 840 ft./min. and the service ceiling 17,500 ft. The time to take off is 26 seconds.



NOISELESSNESS: The cabin of the "Kent" class is remarkable for the small amount of noise which reaches the passengers. On the left one of the beaching trolleys.

PRIVATE FLYING & GLIDING

LONDON AEROPLANE CLUB

Many members of the London Aeroplane Club have spent their summer holidays at Stag Lane and the amount of flying done has therefore increased materially. Both Capt. J. T. Godfrey and Mr. Felser Paine, who joined on August 3 and 4, completed the tests for their "A" licences in 7 flying days. Mr. Malet de Roquefort also secured his "A" licence during the last week. Last Tuesday the club was closed officially but quite a large number of members turned up to speed Mr. Mollison to Ireland on the first stage of his proposed Atlantic flight.

THE RYDE FLYING MEETING

We are informed by the Portsmouth, Southsea and Isle of Wight Aviation Co., Ltd., that they will be unable to organise the air pageant which had been arranged for next Saturday, August 20, at Ryde, owing to the increased pressure of their business. This will no doubt disappoint a large number of people, particularly those in the Island, but it is very gratifying to learn that the taxi service being run from the Island to Portsmouth aerodrome is so well patronised. This is undoubtedly largely due to the use of comfortable machines like the Westland "Wessex," and there seems every chance of this service growing so rapidly that it will soon be relied upon by all business people who, when travelling either way, are in a hurry. The aerodrome at Ryde is situated in an excellent position for rapid road transport into the town, and as its surface was prepared in the same way as that of Portsmouth aerodrome, by Hunters of Chester, there will be no likelihood of winter conditions interfering with its use for aircraft.

MAIDSTONE AERO CLUB

Members are joining the Maidstone Aero Club steadily, particularly as the entrance fee of £5 5s. is being imposed in the New Year. Those joining now receive the benefit of having to pay only a half-year's subscription. Count Johnston-Noad, the Managing Director of the Maidstone Airport, Ltd., is acting as Honorary Organiser for the Chatham Air Display, which is being held on October 8 and 9. On Sunday, August 21, there will be a Grass Track Motor Cycle meeting from 3 p.m. and on the following Sunday at the same time there will be a Clay Pigeon Shooting meeting.

SCARBOROUGH AERO CLUB

Lord Grimthorpe opened the new aerodrome of the Scarborough Aero Club at East Heslerton on the main Scarborough-Malton road, about 11 miles out from Scarborough, on Saturday, August 13. Some 20 visiting aircraft competed in the rally while Major J. E. D. Shaw, the President of the club, arrived in his own Avro "Cadet." Other pilots included Flt. Lt. Comper in a "Comper Swift," Mr. J. Scholes in the National Benzole Company's "Puss Moth," Mr. Starling in a "Redwing," Capt. Worrall in a "Moth," Lord Grimthorpe in a "Puss Moth," Mr. L. N. Stace in a three-seater "Spartan," Mr. W. Gairdner in a "Puss Moth," Mr. Davies in a "Desoutter," Messrs. Lacayo, F. R. Walker and R. R. Bentley in "Comper Swifts," the latter belonging to Shell-Mex B.P., Ltd., and Mr. Eville in an "Avian." Mr. F. P. Morgan proposed a vote of thanks to Lord Grimthorpe which was seconded by Mr. A. E. Thompson, chairman of the Directors. In the evening a dance was held at the Pavilion Hotel, Scarborough.

THE ROYAL NAVAL FLYING CLUB

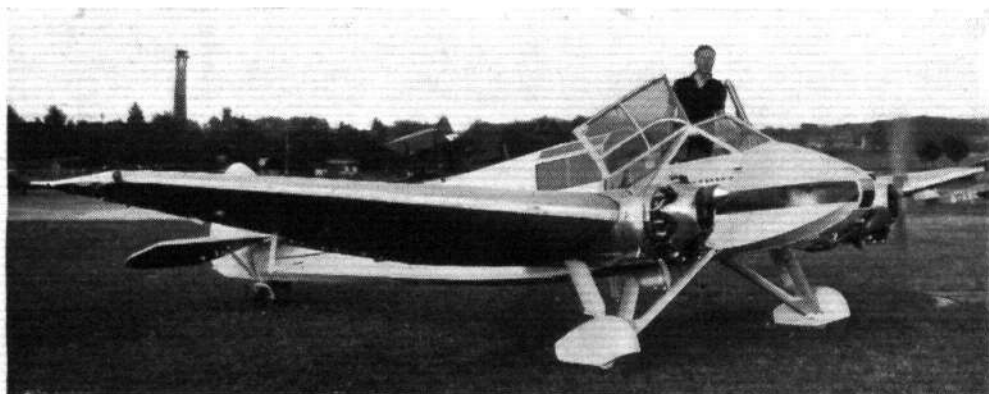
The annual general meeting of the Royal Naval Flying Club was held in the R.U.S.I. on Thursday, July 21. Rear Admiral A. L. Snagge, chairman of the Committee, was in the Chair and he expressed his satisfaction with the growth of the club since its inception in October

last year. The membership had now, he said, grown to 136 active members, while a further 69 officers, at present serving abroad, had registered their names for membership on their return to England. Amongst this very creditable number were 67 holding "A" pilots' licences, 6 holding "B" pilots' licences and 61 qualified Fleet Air Arm pilots. The club, he said, was very grateful to the Committee of the Hampshire Aeroplane Club, who had provided facilities for R.N. members at Hamble and also to the Directors of National Flying Services who had made it possible to form the London headquarters of the R.N. club at Hanworth. He referred to the two members of the club who were eligible for the Siddeley Trophy while competing in the King's Cup race wherein Lt. Com. P. G. T. Rodd, R.N., flying his own "Puss Moth," finished sixth in the main race and second in the Siddeley Trophy race at an average speed of 128.25 m.p.h.

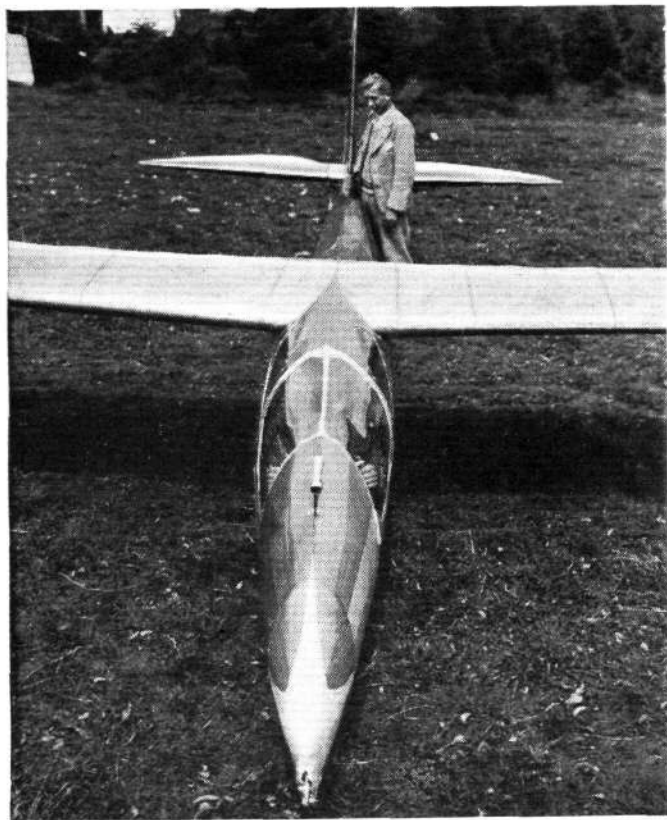
The following officers were elected to the Committee:— Lt. Com. P. G. T. Rodd, R.N., Lt. G. G. R. Rodd, R.N., and Lt. P. Du Cane, R.N. Lt. G. G. R. Rodd has now undertaken the duties of Hon. Sec.

THE WEEK-END AÉRIEN

Room 170, Mayfair Hotel, London, W.1, is the address of the committee which is arranging the week-end Aérien to take place from Thursday, September 1. As we have already stated, this week-end has been arranged as a means of returning the hospitality which British private owners have invariably received when they have visited aerodromes on the Continent. Already some 80 foreign pilots have accepted the invitation to visit us and they will be coming from France, Germany, Holland, Belgium, Italy, Poland, Yugoslavia, Czecho-Slovakia and Switzerland. A very comprehensive programme has been arranged starting from noon on the Thursday with an arrival Rallye at Heston. This programme will include visits to Bristol, Hooton, Hanworth and the Midlands as well as hospitality dispensed by Lady Elibank, the Lord Mayor of Liverpool, National Flying Services, and also special arrangements made by the Executive Committee at Poulsen's Club at Datchet, the Mayfair Hotel, at Lympne aerodrome and on board s.s. *Adriatic* at Liverpool. The visit to Bristol and Hooton will take place on the Friday, finishing after a dinner in s.s. *Adriatic* with a Ball in the Liverpool Town Hall. On Saturday the party will continue to the Midlands and wind up with a dinner at the Mayfair Hotel in London. On Sunday N.F.S. are entertaining the party to lunch at Hanworth and the final leave taking will be at Lympne. It is hoped that a large number of private owners and others will assist to make the week-end a successful and enjoyable one for the visitors; all those wishing to attend any or all of the various functions with this end in view should apply to the Hon. Sec. of the Committee to the above address as soon as possible for tickets entitling them to do so, as it is obvious that only those who have obtained tickets beforehand can be allowed to swell the party. Finally, we might say that any donation from 10s. upwards will be gratefully accepted for the expense fund, and those who would like to join should send their cheques to the same address.



Mr. A. C. M. Jackaman's newly acquired "Monospar." The head-light aperture is clearly visible in the nose of the fuselage. (FLIGHT Photo.)



LOW HEAD RESISTANCE—STYLE ONE : Herr Wilhelm Benz, pilot of the "Meiningen," looks well protected by the cello streamlining of his sailplane at the Wasserkuppe.

FOR THE FASTIDIOUS PRIVATE OWNER

The new "Monospar" machine described in FLIGHT for April 22 must be one of the most luxurious, sensible, and safe, private owner's machines at present being manufactured. The latest of this type was delivered to Mr. Maurice Jackaman at about 5 p.m. on Friday, August 12, having made its first flight test and received its C. of A. all on that day. Mr. Jackaman, who was in camp with No. 601 Squadron A.A.F. at Lympne, immediately flew the machine down there and did some night flying the same evening. As is usual with Mr. Jackaman's machines it is superbly finished and has much in the way of special equipment including all the standard range of Smiths' instruments, Reid & Sigrist Pitch and Turn Indicators, an Air Log and a very complete electrical equipment by Rotax including a large dipping and swivelling Vickers head lamp with a Phillips bulb. Mr. Jackaman tells us that he has already made landings by night with the aid of this lamp and finds it excellent for the purpose. The engine instruments, which are placed on each engine cowling, are illuminated for night flying by means of a small lamp placed behind a tiny square window in each side of the fuselage. With its excellent take-off, high top speed and ability to fly on one engine, Mr. Jackaman's "Peridot V" will undoubtedly be the envy of private owners, not only in this country, but throughout the world.

CINQUE PORTS FLYING CLUB

Mr. K. K. Brown, the club's instructor, has been working very hard during the past week and, during the 25 hours' instruction which he put in, he passed out Messrs. Langdon, Dodson, and Hall Caine for their "A" licences. The Folkestone Aero Trophy Race takes place on August 25 and so far fifteen entries have been received including such diverse machines as an "Autogiro" and a Gipsy III "Comper Swift." A very keen race is looked forward to and no doubt the finish will be a spectacular one as the handicapping is in the hands of Messrs. Rowarth and Dancy. On September 3 and 4 the Club is holding a public flying meeting, it being hoped to secure R.A.F. co-operation for the first day, while on the second day many foreign pilots who are visiting England as guests of British private owners will be arriving at about 2.30 p.m. The aerodrome has been enlivened greatly during the past fortnight by the presence of No. 601 (County of London) (Bomber) Squadron Auxiliary Air Force who

have been in camp there for their annual period of training. On Thursday last week H.R.H. the Prince of Wales flew to Paris and 601 had the honour of escorting him until the flying boats took over for the cross-channel trip. Night flying will be recommenced this week as the club machine G-AABJ has now been fitted with wing tip flares in accordance with Air Ministry Notice to Airmen No. 12 of 1932.

HANWORTH

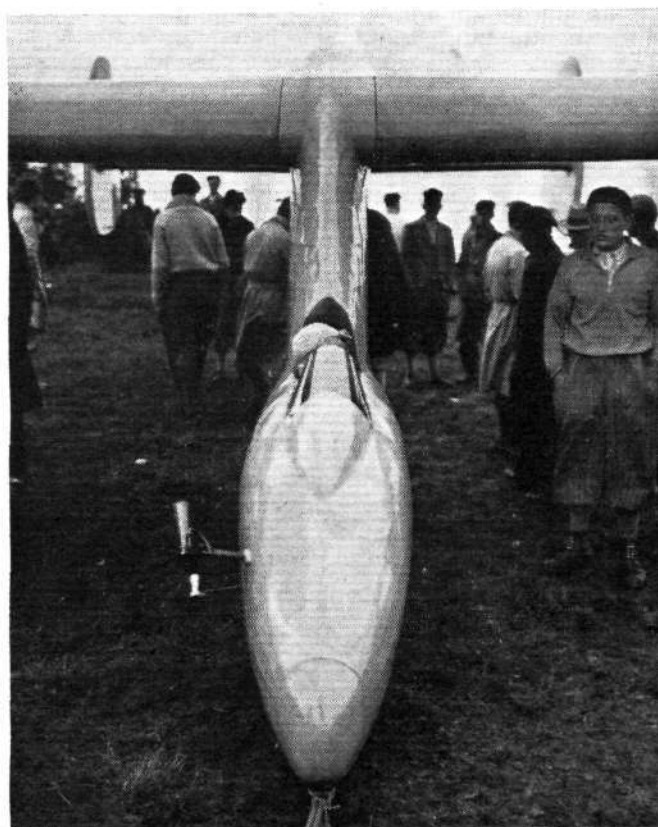
The fine weather has naturally increased the number of flying hours very considerably at Hanworth and many pupils are now nearly ready for both their "A" and "B" licence tests. Quite a large number of taxi work and cross country flights have been done recently and Flt. Lt. J. B. Wilson, who has now joined the staff again after his sojourn in Gibraltar, has been to places as far apart as Burnham and Penshurst during the past week. Night flying was carried out until the early hours on Wednesday night, while among those who have made their first solo flights are Mr. Walters and Mr. Llewelyn and those who have taken their "A" or "B" licence tests are Lt. Mayers and Mr. Hill.

AT GATWICK

Three machines from the Surrey Aero Club were unfortunate in the weather they met in the Channel on Monday, August 15, when they set out to attend the meeting being held by the Aero Club de Boulogne at St. Englevert and, after having to turn back from about midway, they altered their programme and paid a visit to both Lympne and Shoreham-by-Sea before returning to Gatwick. An increasing number of members is now joining this attractive country club since it has been re-organised under the management of Redwing Aircraft, Ltd., and being within easy reach of London many are finding it an extremely pleasant place at which to spend the week-end.

MEMORIAL TO OTTO LILIENTHAL

A monument to Otto Lilienthal, the German glider pioneer, was inaugurated on August 10 at East Lichterfelde, Berlin, on the mound from which Lilienthal made the gliding flights on one of which he was killed 36 years ago.



LOW HEAD RESISTANCE—STYLE TWO : Herr Robert Kronfeld believes in a blunter nosed fuselage than the "Meiningen" as can be seen from this unusual view of his "Austria" taken shortly before his accident at the Wasserkuppe.



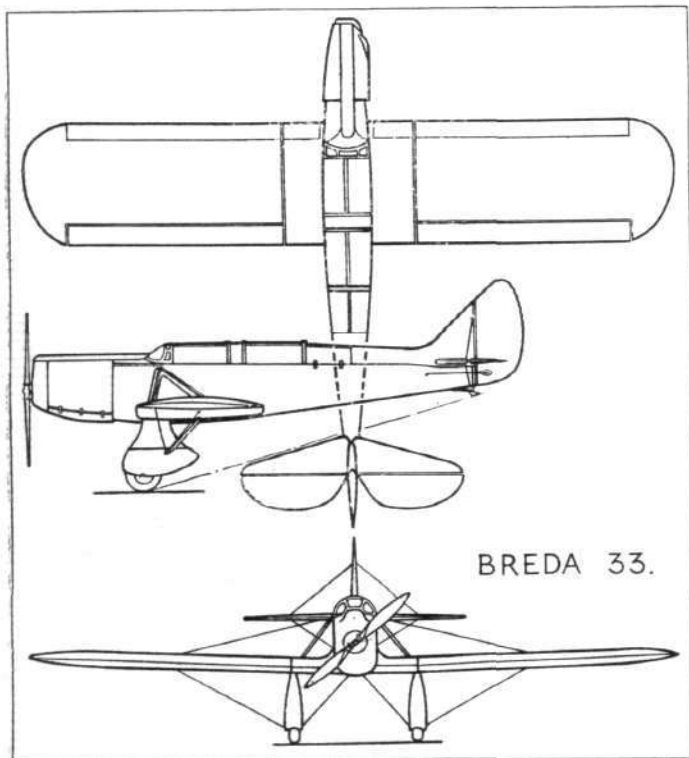
The "Breda 33"

AS the type piloted by Miss Winifred Spooner in the International Touring Competition, particular interest attaches to the "Breda 33." The machine, designed by Signor Pallavicini, is a development of the original "33" which did so well in the 1931 Circuit of Italy.

The "Breda 33" produced for the 1932 International Touring Competition is, like its prototype, a low-wing monoplane cabin two-seater. The wing is of bi-convex section with small travel of the centre of pressure. The particular section used is not deep enough to allow of economical cantilever construction, and external bracing has, therefore, been employed. This takes the form of a pair of struts to the spars, on the upper surface, to brace the wing against landing shock loads, and for the rest the bracing is by streamline wire. The wing covering is plywood, and Handley Page automatic slots are fitted. These slots, incidentally, extend over the whole wing span, and the slats are of larger area than usual, so that not only do they preserve lateral stability at the stall, but they are



MISS SPOONER'S "BREDA 33": The wheels are carefully faired in, and have a travel of nearly one foot (including the deflection on the tyres). The slots extend over the whole wing span. The engine is a de Havilland "Gipsy III."



THE "BREDA 33."

Length o.a., 24 ft. 6 in.; wing span, 32 ft. 2 in.; wing area, 180 sq. ft.; weight empty, 1,058 lb.; disposable load, 662 lb.; gross weight, 1,720 lb.; maximum speed, 137 m.p.h.; cruising speed, 125 m.p.h.; landing speed, 30 m.p.h.; climb to 13,200 ft. in 17 minutes; service ceiling, 22,000 ft. (with Colombo S.63 engine).

reported to increase the speed range of the machine considerably by reducing the landing speed. Indeed, for a wing loading of 9.55 lb./sq. ft. the landing speed is claimed to be as low as 30 m.p.h. This would require a maximum lift coefficient of about 2 in British "absolute" units! Even Mr. Handley Page does not claim that his slots will increase lift to that extent. No bi-convex wing section has a very high k_{Lmax} , and thus the minimum speed of the "Breda" must be a good deal higher than 30 m.p.h. It may, however, be possible to "touch down" at roughly 35 m.p.h. However that may be, we believe that the "33" does have a very low landing speed and that it hangs in the air with its tail well down without showing signs of loss of control.

The fuselage is of welded steel tube construction, and the undercarriage, of the spat-faired type, has a travel of nearly 1 ft. Wheel brakes are fitted.

The cabin normally has seating accommodation for two, but an occasional third seat can be fitted. The sliding windows give any desired degree of ventilation.

Dual controls are fitted, the passenger's controls being detachable. Normally the pilot occupies the front seat. An interesting feature is that control stick, rudder bar and seat are adjustable, so that pilots of different heights can be accommodated. The seats, by the way, are adjustable fore and aft as well as in height.

The following instruments are fitted: Airspeed indicator; revs. indicator; altimeter; oil pressure gauge; petrol gauge; oil thermometer; turn and bank indicator; watch and compass.

The "Breda 33" is fitted as standard with the 130-h.p. "Colombo S.63" engine, but Miss Spooner's machine has the "Gipsy III."

AIR TRANSPORT

THE AUSTRALIA-ENGLAND AIR SERVICE

THERE are indications that the all-British air service between England and Australia is now really receiving serious consideration. It is reported that Imperial Airways have informed the Federal Government that they are prepared to extend their present Far East service to Singapore if arrangements are made for a connection there from Australia.

The Departmental Committee recently appointed to consider a proposal for a connection with the Imperial Airways service at Karachi is now preparing to report upon the Singapore proposal. The Committee is negotiating with financial institutions, newspapers and leading business men with a view to estimating the probable amount of mail matter which would be sent to Great Britain by the service. Its report is expected in three weeks.

The following "Points for consideration" regarding this service are also published in *Airways Bulletin*, issued by West Australian Airways:—"The steps taken by the Minister for Defence (Sen. Sir George Pearce) as a preliminary to the establishment of the Australia-England air-mail service would indicate in unmistakable fashion the appreciation of the pressing need for such a service. Once this service becomes established a letter may be sent to England and its reply received in any Australian capital in just half the time it now takes by the slower methods of transport.

"A survey of the whole aviation position is to be made by a Committee appointed by the Government and consisting of representatives of the Postal, Defence, Railway and other interests, and it has been announced that the efficiency and utility of existing Australian air services will be closely investigated, together with the special requirements of the proposed new air service. Australia has been fortunate in the past, because the majority of flying operations under contract to the Civil Aviation Department have been carried out with commendable efficiency and at a most economical cost per mile. America and Europe, with keen competition in aviation, have provided interesting figures in economical running and efficiency, and these stand as a basis of comparison.

"Under the proposed plan of Australian development, any inefficient services can be quickly determined and eliminated, so that the soundness of the new services is assured, while the cost can be readily computed. With

the knowledge that the fuel used and the capital cost of the aircraft and engines is far greater in Australia than in most other countries, the payment of rates that bear comparison with those paid elsewhere will provide immediate proof that the services are to be economically sound. Efficiency must go hand in hand with economy, for a cheese-paring policy would soon undermine efficiency, and it is essential in a service of this kind that a high safety-margin be set and maintained. A service once established must ensure the speedy transport of mails with unbroken continuity of service, and this is only possible where machines of a suitable type are used, and where both the experience of the operators and the mechanical capabilities of the equipment are proved beyond doubt. Payment, on the other hand must be consistent with the service given, the efficiency achieved and the safety provided. It must not be forgotten, too, that an investigating committee will also consider the safety-margin of finance of any concerns submitting schemes to it, for while the physical margin of safety is a matter of moment, so also is the ability of operators to maintain a service in the face of unexpected financial obligations that might arise.

"Aviation concerns which have maintained long airways in the past in an efficient manner will have undoubted claims to be the ones to be entrusted with the responsibility of Australia's biggest aviation plan, and when a number of aviation companies, whose records of safe and satisfactory service are so well known, declare their willingness to unite in such a project a stronger feeling of confidence is generated than would otherwise be the case.

"Doubtless there are many who are anxious to participate in such a scheme as that recently proposed, even to the extent of submitting prices which look inviting in comparison with those of established and efficient services in other parts of the world, but the final consideration rests upon more than mere price; and it is those matters of sane economy and high efficiency which any investigating committee will weigh up against the specious allurements of mere price alone, past performances of unsatisfactory contractors having provided monuments of ridicule which cannot be obscured from the view of members of the Committee, and which will act as warning beacons to guide the Government into the safe course at reasonable cost for Australia's aviation future."

The Isle of Wight Air Ferry

WE have received some interesting notes regarding the progress of the air service between Portsmouth and the Isle of Wight, operated by Portsmouth, Southsea and Isle of Wight Aviation, Ltd. The service was started on June 27, and between this date and August 11, 1,700 passengers had been carried between Portsmouth and Ryde, of which 440 were passengers making the single journey, and the remainder passengers who made the return journey. Over 50 passengers have so far made use of the combined road and air facilities which are available in conjunction with Solent Coaches, Ltd., to and from London. There are four services a day to and from the island, and this service, with many extras, has been maintained since the start except for a period of two days when it had to be suspended because of the state of the surface of the Company's Isle of Wight Air Port at Ryde after heavy rain, owing to the fact that it is not yet completely grassed over. The Company is also introducing "Round the Island" trips (due to start next week) in which the machine leaves Portsmouth, lands at Ryde and Shanklin to pick up passengers, and then flies round the island. The fare is 29s. 6d., which compares favourably with the starting fare of similar char-a-banc trips in operation, which is 20s. As regards the Company's fleet, the mainstay is the 9-seater Westland "Wessex," and this is very shortly to be supported by a Monospar—the third to be produced.

A Kenya-Tanganyika Air Service

It is reported that a coastal air mail service linking Nairobi with Mombasa, Tanga, Zanzibar, and Dar-es-Salaam, and operated by Wilson Airways, Ltd., was due to start on August 18. The time-table has been arranged to give connections with the Imperial Airways Service. The new service will permit passengers from Nairobi to

reach Dar-es-Salaam in a few hours as compared with the several days required at present. From Nairobi to Mombasa the fare will be £6, and from Nairobi to Dar-es-Salaam £14.

A New Desert Air Service

A NEW desert air service, designed to save travellers the discomfort of the two days' journey by desert car between Palestine and Iraq, will be opened by Imperial Airways on September 5 according to *The Times*. The aeroplane will make the westbound journey from Baghdad to Galilee in 5½ hours, and the eastbound flight from Ramleh to Baghdad in 7¾ hours. The service has been arranged so as to make connection with the Lloyd Triestino steamships and negotiations are now in progress with a view to securing joint air and steamship services with through fares. The fare for the air service is £20 in either direction. This is very little more than the desert car fare, though there is a great disparity in speed and comfort between the two methods. The car journey over desert tracks involves two days of jolting in high temperatures. The aeroplane journey will mean at the most eight hours of comfortable travel. The service may readily appeal to persons who could not afford to make the whole journey from Baghdad to Europe by air. It will afford a comparatively cheap and very easy method of access to Cyprus for officials in Iraq, and it may enable the Iraq Administration to accelerate its mails to England. The service will be operated by an Avro Ten air liner. The eastbound journeys will be made on Mondays and the westbound on Wednesdays.

The Clyde-Belfast Service

THE amphibian service between the Clyde and Belfast was opened on August 13 when the new flying-boat *Cloud of Iona* made the first trip. The passengers included Lord and Lady Malcolm Douglas Hamilton.

AIRPORT NEWS

CROYDON

THE first of the new Imperial Airways "Atalanta" class has arrived from Armstrong Whitworth's. Mr. Walters has carried out several tests since its arrival and the real test will be when they are installed on the African route where the atmosphere is much more rarified.

The weather for the past week has been ideal at Croydon, although much fog has been experienced on the Continent, so much so that it has slightly interfered with the early morning services.

British Air Transport have completed arrangements for an aerodrome at Addington, on the borders of Croydon, pretty well directly on the Croydon route of incoming and outgoing aircraft, where they will operate after the end of August. Croydon on an ordinary weekday will certainly be a much quieter place than it has been for many years, as school machines have occupied the air from morning to night. Mr. A. C. M. Jackaman has taken delivery of his new Monospar. I understand he is absolutely delighted with it, and is amazed at its performance. It has been fitted out to his own choice and it certainly looks a beautiful job.

Some months ago in this column I referred to an extension on the arrival and departure area to try and overcome the dust problem of previous years. This summer has put

it to a real test, and it has proved a great success. One can now stand on the flagstones without getting choked and blinded with dust every time a machine takes off. The Air Ministry are now extending the area slightly further out as it has proved such a success. I believe I mentioned before the process is simply a tarry liquid mixed into the earth itself which sets hard, after which it can be tar sprayed or treated as required.

Great indignation has been caused amongst the operating firms at Croydon over an Air Ministry notice they have received during the week, informing them all that from February 1 next new landing and housing rates will be coming into force. Apparently instead of a hoped for reduction in rates, they are being raised pretty stiffly in many cases, and the people who carry on the joyriding businesses say quite definitely that they simply will be unable to carry on and will have to quit, as the new rates will kill them.

Passenger traffic still maintains a fair level, although the height of the season is about passed. Another few weeks will see the end of summer, when everyone will have a well deserved respite from the rush and tear.

Traffic figures for the week:—Passengers, 2,379; freight, 84 tons.

P. B.

FROM HESTON

MONDAY, August 8.—Five machines returned from abroad, two from Berck, one from Zoute, one Brussels and one Paris. Among the private owners flying was Mr. Francis, who made a trip to Cowes and back in his Sikorsky. Representatives of the Air Ministry attended a demonstration of night flying with the aid of the Chance Flood Lighting installed at Heston.

Tuesday.—Banco's "Puss Moth" returned from Paris with Mr. Davenport finishing off a trip round Germany. Two interesting departures were Mrs. Mollison (Miss Amy Johnson) and Mr. Mollison. Mrs. Mollison left at 4.30 p.m. in G-ABVW (Jason IV) and Mr. Mollison in G-ABXY at 5.35 p.m., the intention being that he in the faster machine should catch his wife up over the Irish Sea. Airwork School of Flying had another busy day and were fully employed up to dusk. Viscount Borodale flew one of the School machines over to Hatfield during the afternoon.

Wednesday.—The Countess of Haddington set off at 10 a.m. in one of the School machines for Kelso, Scotland, accompanied by Capt. Dan Cameron as navigator, he returning with the machine to Heston later in the day. Mr. Ahlers was the first to leave for the Continent, taking off at 9.40 a.m. for Paris. Brig. Gen. A. C. Lewin left for Munich in his "Puss Moth" with one passenger. Capt. Hargreaves left during the afternoon in his Klemm for Ostend, returning in the evening; also Mr. Perkins for Ostend in his "Moth" and Miss Winifred Spooner in her Breda 33 (G-ABXK) for Amsterdam. Airwork School of Flying had one machine engaged on photographic work for over two hours and altogether the School machines did over 20 hours flying—it seemed everybody wished to take advantage of the wonderful weather to fly.

Thursday.—Banco kept up their record of no blank days—one machine leaving for Berck returning the same day and another to Cologne and Coblenz. Other Customs clearances were two to Berck, two to Cologne, one from Paris, two from Berck and one from Cologne—that from

Cologne being Brig. Gen. Lewin on his return from Munich. Airwork School of Flying had a charter to Hooton.

Friday.—Customs clearances again made a good show being two to Berck, two from Berck, one from Cologne, one from Brussels, Mr. Cliff from Paris on G-AAVO completing his trip from Naples. An interesting arrival was Mr. Jamar in "Moth" ZS-ACZ, with one passenger, on his arrival from Leopoldville, Belgian Congo. Mr. Gordon Selfridge engaged in night flying with the aid of the flood lighting installed at Heston. Mr. R. Denman made a quiet "get-away" for a short week-end on the Continent, leaving for Deauville in his "Puss Moth."

Saturday.—Mr. Francis made a quick trip to Berck and return before lunch on his Sikorsky. Mr. Jamar departed for Ostend on ZS-ACZ; two other machines left for Berck, one to St. Ingelvert. Banco had a charter to the Yorkshire Moors with a grouse shooting party and several trips over London with joy rides. Hon. Ivor Guest qualified for his "A" licence. Mr. Maurice Jackaman brought his new Monospar G-ABVP to Heston to-day—it was the admiration and envy of a large crowd. We feel that in the near future Heston will become known among what may be termed the non-flying members of the population. To-day one hundred members of the Hounslow and District Province of the Royal Ancient Order of Buffaloes made a tour of the Airport, sampled the joys of the air and watched the many arrivals and departures of machines while partaking of tea at Heston Verandah.

Sunday.—Two more new pupils commenced instruction to-day making in all ten during the past week. Two Motor Clubs made Heston Airport their rendezvous to-day and were so delighted with their experience that they hope to make a return visit some time this year. Mrs. Spencer Cleaver made a welcome re-appearance at Heston and commenced a refresher course with Capt. V. H. Baker. Capt. W. Ledlie of Personal Flying Services, Ltd., arrived from Yorkshire at 6.30 p.m. in the Junkers G-ABDC and departed for Berck with two passengers within a very few minutes.



Avian Modification No. 106

We have been requested by A. V. Roe & Co., Ltd., to publish the following announcement:—

The attention of Avian owners is directed to the following caution:—When the aircraft is flown solo from the rear cockpit, the Sutton Harness in the front cockpit must be pinned together. If this is not carefully carried out there

is a tendency for the thigh straps of the harness to slip down, thus obstructing the movement of the pilot's feet in the rear cockpit. To overcome any chance of this, a small coil spring is introduced which secures the thigh straps and attachment wires to each side of the front seat. The necessary parts and instructions for fitting can be obtained from A. V. Roe & Co., Ltd., 166, Piccadilly, W.1.

AIRISMS FROM THE FOUR WINDS

The Princes with the Mediterranean Fleet

T.R.H. the Prince of Wales and Prince George left Fort Belvedere, the Hampshire home of the Prince of Wales, on Thursday, August 11, for Corfu, each Prince flying as passenger in a separate private aeroplane while a third acted as escort. They arrived at Le Bourget the same afternoon. There they took the Simplon express for Venice which was reached on August 12. After an official reception and a tour of the city, the Princes spent the night at a hotel on the Lido. On Saturday they both embarked on the Imperial Airways "Kent" boat *Satyrus* and flew to Corfu and went aboard the *Queen Elizabeth*, flagship of the Mediterranean fleet. The fleet then put to sea, carrying out various exercises, including an aircraft attack on the ships. On Tuesday, August 16, both Princes were flown off the deck of the carrier *Glorious* and immediately after fog came down round the ship. The Prince of Wales' machine got back and landed on the deck just as the fog was closing in, but Prince George's machine and some others had to remain in the air, talking to the carrier by wireless, until a clear gap was found, when all the machines landed safely on the deck.

Mrs. Victor Bruce 54 Hours in the Air

THE Hon. Mrs. Victor Bruce's third attempt on the endurance record in the Saro "Cloud" *City of Portsmouth* ended, somewhat suddenly, with a duration of 54 hr. 13 min. The *City of Portsmouth* ascended, as reported last week, from Cowes, on August 9, with Mrs. Victor Bruce, Flt. Lt. J. B. W. Pugh and Flt. Serg. W. R. McCleery on board. They proceeded, after refuelling, to Ipswich, where they cruised around until August 11. Shortly before 6 p.m. on the third day it was found that the oil temperature was over 100 deg.—owing, it seems, to filter trouble—and as they were unable to remedy this in the air, it was decided to come down, and so they alighted at Felixstowe at 7 p.m. Unfortunately; the Royal Aero Club's sealed barograph had been eliminated from the machine equipment, so that strictly speaking Mrs. Bruce has only unofficially broken the British endurance record of 50 hr. 38 min. set up in 1929 by the late Sqd. Ldr. A. G. Jones-Williams and Flt. Lt. N. H. Jenkins in the Fairey (Napier) monoplane. We hope to give further details of Mrs. Bruce's attempt later.

Hausner's Aeroplane Salvaged

THE Italian steamer *Escambia* has reached Genoa with Mr. Stanley Hausner's Bellanca monoplane *Rosa Maria*, which the steamer picked up on July 24 after it had been afloat since Hausner fell into the sea on June 4 during his Atlantic flight. Hausner, it will be remembered, was rescued, after eight days' afloat, by a Shell tanker.

"Autogiro" Developments

Now that the daily press has got hold of the story, it has become necessary to place on record the true facts

about the latest "Autogiro" development planned. This concerns a very small single-seated low-power machine, which it is hoped to market at a very low price. The power plant will be a small two-cylinder engine, and will be built by a well-known firm of motor cycle engine manufacturers. The power will be in the neighbourhood of 50 h.p. The new "Autogiro" will incorporate certain innovations, such as direct control of the rotor (i.e., tilting of the rotor head) instead of the indirect control hitherto used (controlling the whole machine by aerodynamic surfaces). By doing this, it will be possible to do away with the present fixed lower wing altogether, and as the rotor blades will be made to fold, the space required for garaging will be no more than that of an average size motor car. The overall length will be only about 15 ft., and the rotor diameter about 24 ft. It is expected that a cruising speed of somewhere in the neighbourhood of 80 m.p.h. will be attained. The new type of "Autogiro" is at present very much in the experimental stage. In fact, the first of the type has not yet been built, and as "teething troubles" have to be reckoned with, it is quite impossible to forecast when the new machine can be put into production on a large scale. But the development is a very interesting one, and may very well alter very materially the whole position of private flying.

The South West Africa "War"

THE contumacious chief of a tribe in Ovamboland, South West Africa, was duly attacked by three aeroplanes of the South African Air Force under Sir Pierre Van Ryneveld, and by two armoured cars. Warning was given, and the women and children were sent away from the kraal before the aircraft attacked it with bombs and machine guns. Some cattle were killed, but there were no human casualties. The crew of one car were attacked by wild bees and severely stung. The chief has been deposed.

Anti-Aircraft Territorial Units

A MILITARY correspondent of *The Times* states that the Cornwall Heavy Brigade of Territorial Artillery, whose records date back for over 70 years, is one of the units selected to provide an anti-aircraft unit.

An Aerial G.P.O.(uting)

FORTY postal officials, including seven women from the Mount Pleasant office, London, E.C., had an aerial outing on August 14, when they travelled about 45 miles by air to Clacton-on-Sea. Five aeroplanes carried them from an aerodrome near Romford, Essex. After a day on the sands they returned by air to Romford.

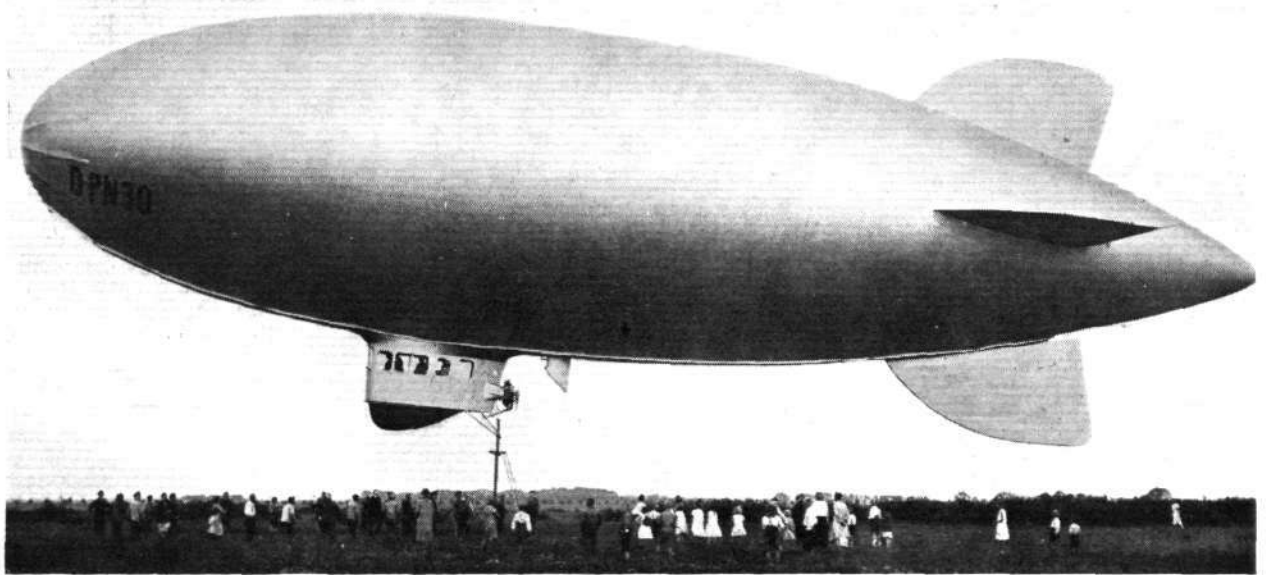
Bombay Aerodrome at Juhu

MUCH progress has been made in the layout of the ground of the aerodrome at Juhu (Bombay), although the ground is not fit for use during the present monsoon. The layout work commenced eighteen months ago and so far a sum of Rs. 800,000 has been spent.



A CANADIAN "GIANT MOTH": Built almost entirely at the de Havilland Toronto factory, this machine was recently supplied to the Ontario Provincial Air Service for Forest Patrol duties. It was first tested by E. Leigh Capreol (chief D.H. pilot) as a landplane, and then flown to Ottawa, where it was fitted with floats for operation as a seaplane at Sault Ste Marie. Readers with microscopical sight may recognise our old friend R. A. Loader standing (left) beneath the engine—which is a Pratt & Whitney "Hornet."

A NEW GERMAN AIRSHIP



GERMANY has, on previous occasions, produced a few successful small airships, in addition to the large rigid Zeppelin airships. Just recently a new small airship, type Parseval-Naatz P.N.30, was made by the Wasser-und Luft-Fahrzeug G.m.b.H. of Seddin. This airship has been developed largely upon the experiences gained with a previous small airship produced by the Parseval firm, the P.N.28, several modifications and improvements having been introduced in the P.N.30. Prior to and during the war, the Parseval-Naatz airships were of the non-rigid type, but in the smaller airships the semi-rigid system has been adopted. The new P.N.30 is of this latter type, having a length of 46 m. (151 ft.), a diameter of 10.8 m. (35 ft. 6 in.), a height of 16 m. (52 ft. 6 in.), and a volume of 2,600 m.³ (91,832 cu. ft.).

In spite of its small size this airship has most of the modern fittings hitherto confined to the larger rigid airships, and as a result it has been possible to improve the performance and reliability of this little airship. The P.N.30 has a very favourable drag coefficient. The keel of the P.N.30, which also serves as the catwalk or passage, is within the envelope, and is built up of a series of detachable and interchangeable struts, so jointed that a certain movement in the vertical plane is provided. The rear end of the keel is developed into a cruciform to take the tail surfaces, and it is possible to walk along the full length of the keel to the tail and so carry out any adjustments or repairs to the latter. The catwalk has a height of 1.8 m., and contains all the necessary fittings, tanks, etc. Attached directly to the keel is the car, of streamline

shape, in front of which is the control cabin. In the centre is a cabin accommodating five passengers, and at the rear is a 115 h.p. Siemens type Sh.14 7 cyl. engine, which is fitted with an electric self-starter.

The envelope, having a fineness ratio of 4.4, consists of a very strong double cotton fabric with a strong intermediate gumming. The fabric is claimed to be unaffected by atmospheric conditions, enabling the airship to remain for long periods in the air.

It has been usual practice in semi-rigids to maintain a uniform pressure in the envelope by means of an uninterrupted flow of air through the balloonet, and the gas valves. In the P.N. 30 the pressure adjustment is, for the first time, carried out automatically, by means of a pressure regulator, a distributor box, and a blower. The pressure regulator consists of a membrane, attached to the envelope, connected by levers to the inlet and exhaust valves of the distributor box in such a manner that when the pressure rises, the membrane causes the exhaust valve to open and the air to escape into the open. If the pressure falls below a certain limit, the exhaust valve is closed and the inlet valve opened, air from the blower thus being allowed to enter the balloonet. The operation of the gas valves is also automatic, so that a constant and uniform pressure is always maintained, thus simplifying considerably the control of the airship.

The P.N.30 has already flown successfully, and develops a speed of 80 k.p.h. (49.75 m.p.h.), has a useful lift of 1,000 kg. (2,205 lb.), with fuel for 12 hr. duration, or a range of 1,000 km. (620 miles).



A LATE ENTRY: The Raab-Katzenstein type 25-32 (Argus engine) arrived at Staaken for the International Touring Competition at the eleventh hour, and the entrants had to pay double fee. The machine is fitted with the new Ksoll slots and camber gear, and is reported to have a speed range of 150-37 m.p.h., or more than 4:1!

CORRESPONDENCE

RELATIVE EFFICIENCY

[2806] Perhaps it would interest your readers to know that in the vacation we have endeavoured to evolve a formula which will indicate the relative efficiency of various machines. This formula is not intended to be conclusive, since we cannot obtain sufficient data about each machine. It applies to civilian machines fully laden. The data we have taken entirely from your excellent publication. It is interesting to compare certain machines by our formula and we have spent considerable time amusing ourselves in this way. This formula is as follows:—

$$R.E. = \text{Everling H.S.F.} + \left(\frac{\text{disposable load} + \text{fuel} + \text{oil}}{\text{tare weight}} \right) 25 \\ + \left(\frac{\text{Speed range}}{10} \right) + \left(\frac{\text{No. of engines}}{\text{pints of fuel/B.H.P./Hr.}} \right) 2$$

Example:—

$$\begin{aligned} &\text{Relative efficiency of the Percival Gull} \\ &= 27 + (.75 \times 25) + \left(\frac{103}{10} \right) + \left(\frac{1 \times 2}{.53} \right) \\ &= 27 + 18.75 + 10.3 + 3.63 \\ &= 59.7 \text{ (correct 1 place decs.)} \end{aligned}$$

We append herewith a list of results for some more machines:—

Percival Gull: Hermes IV	..	..	59.7
Monošpar St. 4: 2 Pobjoy "R"	..	..	59.0
Breda 32: 3 Wasp Junior	..	..	57.5
D.H. Fox Moth: Gipsy IIIA	..	..	56.2
A.W. Atalanta: 4 Double Mongoose	..	..	55.0
Fokker F. XVIII: 3 Wasps	..	..	54.7
Spartan Cruiser: 3 Gipsy III	..	..	53.9
D.H. Fox Moth: Gipsy III	..	..	52.0
Lockheed Orion: Wright Cyclone	..	..	51.1
(Undercarriage not retracted.)			
D.H. Moth (wooden): Gipsy IIIA	..	..	50.4
Curtiss-Reid Courier: Gipsy III	..	..	49.0
Bloudek XV: Cirrus II	..	..	47.6
D.H. Tiger Moth: Gipsy III	..	..	46.2
D.H. Moth (wooden): Gipsy II	..	..	45.3
Ford 8A: Hispano Suiza	..	..	43.9
Sabca: 3 Renard 120 h.p.	..	..	41.6
Canadian Cub: Scorpion II	..	..	41.6
Lockheed Orion (undercarriage retracted)	..	..	67.9
Comper Swift: Pobjoy "R" (gross weight 1,060 lb.)	..	..	57.2

Doubtless there are small mistakes due to the paucity of our knowledge of the fuel consumption of various engines at full throttle. It should also be noticed that we have taken the wing area to include the ailerons. Whether this is correct or not we do not know, but some of our results for the Everling H.S.F. seem to agree with those published. The constants, as far as we can judge, seem to bring the value of each factor to within a fair degree of its true proportion. We should like to add in this connection that our judgment may be at fault for neither of us is over sixteen years of age and we have relied upon the written opinions of others in this matter. We should very much like to be corrected if anywhere we are found to be grossly inaccurate. We are fully aware that our formula does not take into account such features as view from cockpit, take-off and landing runs, price, and safety devices. Yet our formula includes most of the features usually considered of paramount importance, namely, aerodynamic efficiency, ratio between load carried and structural weight, landing speed and top speed, economy of fuel and immunity from forced landings due to engine failure. From the results obtained it can be seen that machines considered to be outstanding in the category under which they fall are grouped together near the head of the list. Thus, it seems that the efficiency of machines of different sizes and designed for totally different work may be in some way compared.

Wimbledon, S.W.19.
August 15, 1932.

F. NAISH—F. PAGE.

RISKS OF CLOUD FLYING

[2807] I am extremely interested in Flt. Lt. W. E. P. Johnson's letter in today's issue regarding accidents due to heavy clouds such as in the Meopham and Bossom crashes. It becomes clearer to me almost every day that in this country, which is so variably undulating and has

such variations of weather even within small areas on the same day, the ordinary aeroplane has very many disadvantages when away from good aerodromes or the very small areas of flat ground which are only in the eastern districts.

Surely, therefore, despite prejudice in many quarters, a development of the Autogiro principle is going to be the most helpful in the avoidance of such catastrophes from the fact that it is definitely anti-stalling, and even if it should get near the ground when in a cloudbank its angle of incidence will be much nearer to the horizontal than the orthodox type of machine and therefore will not want any violent pulling out. I do not think designers think sufficiently about safety.

Incidentally, this principle, provided the price can be brought down, answers the pleas of Mr. A. H. Downes-Shaw and Mr. W. O. Manning for better value, more "blunder proof," and also for small field work.

London, W.C.2.

H. C. NEWTON.

August 12, 1932.

COMPARISON OF "GULL" AND "S.6B."

[2808] I have read with interest Mr. van Hattum's letter and your comments in FLIGHT of August 12 on the above subject and would like to make one or two observations in this connection.

In the first place, it is hardly fair to take 407 m.p.h. as being the top speed of the "S.6B." for comparison with other aircraft. This speed represents the top speed of the aircraft plus some of the speed gained in the initial dive. The official figure for the steady full throttle level speed of the aircraft which broke the speed record is 390 m.p.h. and the corresponding b.h.p. is 2,530. This speed compares directly with the figures of 145 for the "Gull" and the corresponding Everling figures are 23.1 and 27 respectively, which looks pretty bad for the "S.6B."

However, we can go a step further. From a knowledge of the approximate propeller conditions of the two aircraft it is possible to estimate their probable propeller efficiencies at maximum speed. These are 88 per cent. and 82 per cent. for the "S.6B." and "Gull" respectively.

Substituting these in the expression $\frac{\eta}{2K_d}$

we obtain:—

for the "S.6B." $K_d = .0191$

" " "Gull" $K_d = .0152$

i.e., the drag coefficient of the "S.6B." is 25 per cent. higher than that of the "Gull"; surprising at first sight, but easily explicable, since these drag coefficients are, of course, referred to the wing area which means that, as between any two aircraft having for example the same drag but different wing areas, that which has the smaller wing area will show the larger K_d , but it may not be any the less efficient at maximum speed. In other words the Everling high speed figure utilises the wing area as a measure of the size or drag of the aircraft, which is quite all right for conventional types, but cannot possibly be expected to fit in with an exceptional type like the "S.6B." where wing area has been cut down to the utmost limit consistent with safety in the hands of very skilful pilots.

The writer is not in any way finding fault with the Everling method of comparing maximum speed, but is only emphasising the great disadvantage inherent in all general methods of comparing top speeds, namely, that of finding some dimension of the aircraft which is a measure of its drag. The writer generally uses the square of Munk's Equivalent Monoplane Span instead of wing area. This, although suffering from the above same disadvantage, does at least make monoplanes and biplanes directly comparable, which is not the case with the wing area. The ideal dimension is the total projected front surface of the aircraft, since it gives a measure of the efficiency with which the necessary cross sectional surface of an aircraft has been streamlined; it has been found to give very good results indeed but it is obviously quite impracticable for general application. It would, however, be very interesting to compare the K_{ds} of the "Percival Gull" and "S.6B." when referred to their respective cross sectional surfaces in front elevation.

Edgware, Middx.

RICHARD M. CLARKSON.

August 12, 1932.

THE INDUSTRY

A PARACHUTE MANUAL

WHILE the practice of parachuting is now common, both in military and civil aviation, the theory involved is the knowledge of very few persons. For this reason the second edition of the Parachute Manual issued by the Air Ministry is especially welcome. As it costs but 3s. (postage extra), its educating influence should spread widely amongst those interested in the subject. The parachute is not a subject that can be lost in a maze of technicalities, and the Manual is intelligent reading on all of its 112 pages even to the layman, although no essential technical data are sacrificed.

Parachutists themselves have, until comparatively recent times, been at loss for the authentic theory behind their interesting work, and this has led them to assume theories based upon guesswork. Professional parachutists found, for example, that their public was fascinated about figures concerning their velocity when making delayed drops, and rather mysteriously a velocity of 250 miles per hour became the accepted figure to quote.

This figure certainly heightened the thrill of parachuting performances for the public, but it was pure guesswork, and it persisted for a long time because there were no experts armed with facts to disprove it. Then official tests were undertaken simultaneously in Great Britain and America, but without conscious co-operation between the experts, and they arrived at similar results.

The figure of 250 m.p.h. was proved to be an exaggeration. The terminal velocity of the human body falling with the parachute unopened was estimated from tests at a figure somewhere below 119 m.p.h., which was the maximum velocity recorded with dummies of the shape and size of a man. In the Manual the particular section on the R.A.F. tests states that a dummy of this nature, weighing 180 lb. and equipped with a dummy parachute pack, appeared to show that a man of average weight reached a terminal velocity of not more than 175 ft. per sec. (119 m.p.h.) in 11 seconds after falling 1,200 ft. These tests also showed that oscillation of the dummy during descent reduced its terminal velocity to about 160 ft. per sec., so that it was reasonably expected that the human figure, which had a greater tendency to oscillate than a dummy, would normally have a terminal velocity, as stated, somewhat lower than 119 m.p.h., probably in the region of 110 m.p.h.

Figures quoted in the Manual give some idea of the rate of fall:—

Height.	Time to fall (secs.).
500 ft. ...	6.5 (approx.)
1,000 ft. ...	10 "
2,000 ft. ...	16 "
3,000 ft. ...	21 "

Referring to the fundamental differences between MANUAL v. AUTOMATIC, the two methods of operating a parachute, the Manual states that the manual operation of a parachute worn on the body has a very decided advantage over the automatic system.

Perhaps the most important of these advantages, it declares, is that the airman is able to leave the aircraft from either side or from any position, a freedom of choice that is clearly impossible when the operation of the parachute is dependent upon a static line secured in some way to the aircraft, which the automatic system demands.

The manual parachute is shown to particular advantage when an airman is obliged to abandon his aircraft whilst it is spinning. It is impracticable to leave from the outer side of the fuselage in a spin, and it is only with a manual type that he has complete freedom to drop out on the inside.

Again, the manual system allows of the "lift-off" method of training, such as is witnessed at the R.A.F. Displays when the wind permits, and this method admirably accustoms airmen to the sensations of parachuting and instils confidence in the apparatus while involving them in very little risk.

A serious drawback to the automatic system, declares the Manual, and one which has caused fatalities in countries where that system has been tested or adopted, is the risk of entanglement. Its static line may be caught in part of the aircraft or in the airman's harness, and thus prevent the parachute opening when he jumps. Entanglement may also arise when the aircraft is placed in certain awkward attitudes. One of the excellent virtues of the manual system is that a delayed opening comes within the power of the airman when he is in danger of colliding with his uncontrolled aircraft immediately after he has abandoned it, and again, in time of war, if he is obliged to leave his machine when it is being fired at, he can fall quickly out of the range of fire before pulling the release ring. This is not possible with the automatic parachute, for it must open when he reaches the end of the static line, that is, in a few seconds, when he may still be in the direct path of his falling machine. The Parachute Manual is essentially a study of the Irvin parachute, for that is the standard type in the Royal Air Force. A photographic record of this type in the act of opening is shown opposite page 37, and is of more than passing interest, because a parachute opens with such great rapidity on release that it is impossible for the ordinary observer to obtain an accurate impression of the process, while the actual user of the parachute cannot observe any stage of the opening as a rule.

The speed of a falling airman definitely begins to decelerate at the moment the inrushing air reaches the apex of the opening canopy and becomes compressed, for that starts the proper shaping of the canopy. The silk is relieved of high stresses and oscillation is checked by the escape of air through the apex.

When an airman is projected from his machine at very high speed—as often happens in a spin—he is spared



How to make a landing! The form of the Irvin Air Chute is clearly shown in this remarkable photograph.

physical injury when the parachute opens by the fact that its opening is not quite so fast as the normal rate. There is usually a delay of a few seconds at a late stage in the opening process, due to the apex of the canopy pumping in and out.

With the standard R.A.F. parachute, which is 24 ft. diameter, the normal rate of opening is $1\frac{3}{5}$ seconds, and the rate of descent for a man of average weight is about 21 ft. per sec.

The Parachute Manual is obtainable from H.M. Stationery Office or through any bookseller.

THE NEW M.G. MIDGET

WE have frequently drawn attention to the predilection which flying people have for using small economical cars for their ground transport. Large numbers of motor car manufacturers have produced vehicles in this category and the M.G. Company can certainly claim to be the pioneer in placing upon the market real sports models of such cars. We have many times referred to the peculiar attributes which the M.G. Midget has for the particular kind of work required of such a car by those whose work keeps them closely associated with aircraft and aerodromes. Last year's Midget made a name for itself which we thought was not likely to be beaten for some time, but the new model, details of which have just been issued, would seem to provide not only an amazingly increased performance but also to have improved in the matter of comfort without sacrificing in any way its sporting character. This wonderful little car is now put out as an 80 m.p.h. model with a close ratio four-speed gear box. Rudge racing type wheels, Dunlop tyres and Triplex glass. More and more do these cars appear to follow out aircraft practice and the power produced, even in the unsupercharged models, from this little engine of only 847 c.c. capacity is simply amazing.

THE ROYAL AIR FORCE

London Gazette, August 9, 1932.

General Duties Branch

F./O. S. R. Ubee is granted a permanent comm. in this rank (Aug. 10). The following Pilot Officers are promoted to rank of Flying Officer:—M. W. L'I. La V. Baker, H. P. Broad, T. N. Coslett, R. F. Smith, and C. M. Windsor (June 20); R. G. Shaw (July 11); W. D. Dennehy (July 29). F./O. R. I. Johnson (2nd Lt., R.A., T.A.) takes rank and precedence as if his appointment as Flying Officer bore date Nov. 2, 1930. Reduction takes effect from July 20. Sqdn. Ldr. W. D. Long, O.B.E., is placed on half-pay list, Scale B (July 25).

The following are seconded for service with the Egyptian Government (Aug. 1):—Wing-Com. Sir Christopher Joseph Quintin Brand, K.B.E., D.S.O., M.C., D.F.C.; Sqdn. Ldr. V. H. Tait.

Sqdn. Ldr. W. D. Long, O.B.E., ceases to be seconded for duty with Egyptian Government (July 25). Lt. G. C. Dickins, R.N., F./O., R.A.F., ceases to be attached to R.A.F. on return to Naval duty (Aug. 2). Lt. (now Lt.-Cdr.) C. W. Byas, R.N., Flying Officer, R.A.F., ceases to be attached to R.A.F. on return to Naval duty (Aug. 14, 1931). (Substituted for *Gazette*, Sept. 1, 1931.) F./O. R. C. Higgins is placed on retired list at his own request (July 31).

ROYAL AIR FORCE RESERVE RESERVE OF AIR FORCE OFFICERS

General Duties Branch

K. H. Higson is granted a comm. in Class AA (ii) as a Pilot Officer on probation (July 25). A. V. Lawes (2nd Lieut. R.A.R.O., General List), is granted a comm. in Class AA (ii) as a Pilot Officer on probation (July 1) (Substituted for *Gazette* July 19.) F./O. W. R. Bannister is transferred from Class A to Class C (June 29). F./O. P. Booth relinquishes his comm. on completion of service (Aug. 4). F./O. W. F. Jaggs relinquishes his comm. on completion of service and is permitted to retain his rank (June 19).

AUXILIARY AIR FORCE

General Duties Branch

No. 600 (CITY OF LONDON) (BOMBER) SQUADRON.—P./O. J. E. D. Benham resigns his comm. (June 9).

No. 608 (NORTH RIDING) (BOMBER) SQUADRON.—P./O. A. N. Wilson is promoted to rank of Flying Officer (Aug. 10).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain E. W. Norton, D.S.C., to No. 5 Flying Training School, Sealand, 5.8.32, to Command vice G./Capt. A. ap. Ellis, C.B.E.

Wing Commanders: H. G. Smart, O.B.E., D.F.C., A.F.C., to H.Q., Inland Area, Stanmore, 1.8.32, for Engineer Staff duties, vice S./Ldr. C. St. Noble. A. N. Gallehawk, A.F.C. to H.Q., Coastal Area, Lee-on-Solent, 1.8.32, for duty as Fleet Aviation Officer to C. in C., Home Fleet, vice W./Cdr. C. O. F. Modin, D.S.C. E. D. Johnson, A.F.C., to No. 99 (B) Sqdn., Upper Heyford, 1.8.32, to Command vice W./Cdr. H. G. Smart, O.B.E., D.F.C., A.F.C.

Squadron Leaders: H. Cockerell, O.B.E., to H.Q., Fighting Area, Uxbridge, 2.8.32, for Air Staff (Armament) duties vice S./Ldr. I. Cullen, M.B.E., A.F.C. R. S. Lucy, A.F.C. to H.Q., Inland Area, Stanmore, 3.8.32, for Air Staff duties vice S./Ldr. L. H. Cockey.

Flight Lieutenants: L. T. Carruthers to No. 5 Flying Training School, Sealand, 2.8.32. G. R. Randle to Experimental Section, Royal Aircraft Estab., S. Farnborough, 25.6.32. S. H. Hardy to H.Q., Inland Area, Stanmore, 5.8.32. A. H. W. J. Cocks to No. 13 (A.C.) Sqdn., Netheravon, 25.6.32. F. J. Knowler to R.A.F. Storage Section, Peterborough, 2.8.32. J. H. Pool to No. 1 School of Tech. Training (Apprentices), Halton, 5.8.32. A. M. Stevens to Home Aircraft Depot, Henlow, 3.8.32. H. E. Falkner to Home Aircraft Depot, Henlow, 6.8.32.

Flying Officers: H. P. Fraser to School of Army Co-operation, Old Sarum, 4.8.32. C. E. Hartley to Home Aircraft Depot, Henlow, 26.7.32. A. H. Houghton to Home Aircraft Depot, Henlow, 30.7.32. N. A. Tait, J. H. T. Simpson, G. H. H. Proctor, F. Whittle, G. J. C. Paul, A. E. Louks, H. B. Collins, R. F. Fletcher, M. E. M. Perkins, R. Todd, G. Farnhill, D. W. Smythe, G. N. Warrington and G. Silyn-Roberts to Home Aircraft Depot, Henlow, 3.8.32. W. R. Worstall, J. T. Stephenson and L. E. Jarman to Home Aircraft Depot, Henlow, 4.8.32.

Pilot Officer W. Pickersgill to No. 203 (F.B.) Sqdn., Basrah, Iraq, 15.7.32.

Stores Branch

Flight Lieutenant S. Bingham to No. 23 Group H.Q., Grantham, 3.8.32.

Flying Officer A. Wall to H.Q., R.A.F., Cranwell, 6.8.32.

Pilot Officers: E. G. Ambridge to Aeroplane & Armament Experimental Estab., Martlesham Heath, 6.8.32. C. F. Harrington to Station H.Q., North Weald, 6.8.32. A. R. Morton to H.Q., R.A.F., Halton, 6.8.32. S. W. Needham to Station H.Q., Upavon, 6.8.32. K. N. Smith to No. 2 (A.C.) Sqdn., Manston, 6.8.32.

Accountant Branch

Flight Lieutenant B. G. Drake to Central Flying School, Wittering, 2.6.32.

Flying Officer R. Peel to Station H.Q., Worthy Down, 6.8.32.

Dental Branch

Flying Officer D. I. Malcomson to Med. Training Depot, Halton, 27.6.32, for an initial course of instruction; on entry into R.A.F. on a non-permanent Commn.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty:—

Lieuts. (Flying Officers, R.A.F.).—C. L. G. Evans (seniority adjusted to Feb. 16) and A. G. Poe, to *Victory*, for R.A.F. Base, Gosport, for B.T.S. (Aug. 13). P. L. Jamison and J. H. T. Boteler, to *Hermes*, for 403 Flight (Aug. 4).

ROYAL AIR FORCE

Flying Officers.—A. E. Louks and H. B. Collins, to Home Aircraft Depot for course (Aug. 3).



A U.S. NAVY SHIP'S FIGHTER: This Boeing "Wasp"-powered carrier fighter of the Navy's Air Service is shown taking off from the flight deck of the U.S.S. "Saratoga," naval aeroplane carrier. The plane is a member of the Navy's famed "High Hat" Squadron, whose pilots are noted for their skill in taking off from and landing on the decks of the "floating airports" and in manœuvring their small Boeing "Wasp"-powered fighters in formation at sea.



FAIREY SPORTS: The finish of the "yacht" race. P/O. Harding's crew winning.

FAIREY SPORTS

THE annual sports meeting of the Fairey Aviation Social and Athletic Club was held at the Fairey Sports Ground on July 23. Amusing as well as serious events were held, and everybody greatly enjoyed the meeting. The winners in the various events were as follow:—

Fairey Cup, 100 yards: S. B. Worraker. Fairey Cup, 220 yards: E. B. Gooch. Dawson Cup, 440 yards: E. B. Gooch. Wright Cup, 880 yards: S. J. Sims. Wright Cup, one mile: L. W. Reeve. Fairey Cup, five miles: H. Baines.

Wright Cup, high jump: H. W. Channell. Dawson Cup, long jump: H. W. Channell.

Fairey Cup, tug of war: Boatbuilders. Hazell Cup, ladies' 100 yards: Mrs. E. Fox. Obstacle race: W. Jacques. Sack race: W. Jacques. Tilting the bucket: R. Davis and A. Roynance. Putting the shot: H. W. Sedge. One-mile walk handicap: R. Cantello. 100 yards handicap: A. Warner. 220 yards handicap: S. T. Williams. 880 yards handicap: W. G. Holmes. One mile relay: Experimental Shop. 100 yards veterans' race: P. O. Harding. "Yacht" race: P. O. Harding's Crew. 100 yards handicap (youths): J. E. Harwood.

Ladies' Events

100 yards: Mrs. E. Fox. 220 yards: Mrs. E. Fox. 440 yards obstacle race: Miss M. Franklin. Egg-and-spoon race: Miss V. Corney. Three-legged race: Miss M. Franklin and Miss A. Conn. Sack race: Miss A. Conn. Skipping race: Miss B. Smith. 80 yards (employees' wives): Mrs. Conway.

The prizes were distributed by Mrs. W. Broadbent.

The Air A.B.C.

We have received the latest development in air enterprise, "The Air A.B.C." for 1932, giving information with regard to routes, time-tables, times occupied in travelling and cost of hotel accommodation included in the air travel. Business men, manufacturers and great British enterprises will find this A.B.C. of air travel of invaluable assistance as it enables them to see at a glance the respective services they will require to reach their far distant destinations on the Continent of Europe. It should also appeal to tourists, for it gives full information regarding air tours in various parts of Europe, etc. It also includes such interesting places as Alexandria, Cairo; Imperial Airways Empire Routes, and the announcement of all the most outstanding features connected with air travel for the British people available at the present time. "The Air A.B.C." will be sent post free on application to George Lunn's Tours, Ltd., 136, Wigmore Street, London, W.1. Phone: WELbeck 6600.

Royal Air Force Club

The Club will be closed for repairs and decorations from 10 a.m. on Monday, August 29, until midday on Monday, September 26, 1932. Members will be the guests

of the following Clubs:—Cavalry Club, Junior Naval and Military Club, Connaught Club. All letters, parcels, telegrams, messages, etc., usually collected by Members of the Club may be called for at the Cavalry Club. Other letters, etc., will be re-directed as Members may require.

IMPORTS AND EXPORTS

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910).

For 1910 and 1911 figures see FLIGHT for January 25, 1912.

For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1930 being given in FLIGHT, January 16, 1931.

	Imports.		Exports.		Re-exports.	
	1931.	1932.	1931.	1932.	1931.	1932.
Jan. ...	£ 7,965	£ 2,456	£ 142,596	£ 122,942	£ 1,074	£ 863
Feb. ...	3,303	2,503	110,587	181,482	1,293	90
Mar. ...	5,615	1,946	83,088	167,195	3,441	200
April ...	2,216	622	213,401	142,145	530	1,128
May ...	1,964	1,747	275,382	138,356	108	5
June ...	6,780	398	78,298	126,330	361	125
July ...	1,790	1,070	177,006	142,702	131	120
	29,633	10,742	1,080,358	1,021,152	7,028	2,531

PUBLICATIONS RECEIVED

Economic Conditions in Turkey. Report by Col. H. Woods, O.B.E. Department of Overseas Trade. No. 519. London: H. M. Stationery Office, W.C.2. Price 1s. 6d. net.

Shepardizing: A Text Book for Architects and Engineers. By G. Petrie and J. C. Mills, Whitehead Brothers (Wolverhampton), Ltd., 32, King Street, Wolverhampton. Price 2s. post free.

Catalogue

Books on All Technical Subjects and Applied Science. July, 1932. W. and G. Foyle, Ltd., 119-125, Charing Cross Road, London, W.C.2.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. (The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

Applied for in 1931

Published August 18, 1932

- 10,910. A. P. THURSTON. Aircraft. (377,178.)
- 11,310. SPERRY GYROSCOPE Co., Inc. Direction-indicators for moving craft. (377,262.)
- 11,978. T. M. MACCASKIE. Aircraft. (377,237.)
- 12,505. BOULTON & PAUL, LTD., and J. D. NORTH. Wings and like structures for aircraft. (377,312.)
- 16,307. H. JUNKERS. Starting i.c. engines. (377,368.)
- 21,981. F. ASHBY & SONS, LTD., and F. ASHBY. Hand steering-wheels of aircraft, etc. (377,440.)
- 22,486. ECLIPSE AVIATION CORPORATION. Engine-starting mechanism. (377,446.)
- 24,118. J. PINTSCH AKT.-GES. Aircraft beacons. (377,472.)
- 29,151. D. K. JETTE. Flying machines. (377,509.)
- 32,575. FIAT Soc. ANON. Crank casings of i.c. engines having radially-disposed cyls. (377,543.)

Applied for in 1932

Published August 18, 1932

- 1,281. N. MESSENGER. Aeroplanes fitted with parachutes. (377,629.)